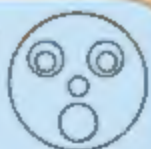
Elementary Mathematics

Class Five

শিক্ষার্থী

(কেজি)

৫ম শ্রেণির শিক্ষার্থীদের ওজন

বিভিন্ন ব্যাসার্ধের বৃত্ত দিয়ে আমি একটি মুখের ছবি এঁকেছি।

আমি এই সুন্দর নকশাটি বানিয়েছি।

National Curriculum and Textbook Board, Bangladesh

Prescribed by the National Curriculum and Textbook Board
as a textbook for class five from the academic year 2013

Elementary Mathematics

Class Five

Revised for the academic year 2025

National Curriculum and Textbook Board, Bangladesh

Preface

Primary level constructs the foundation of education. A set of well-defined targets and properly planned primary education provide strengths to the entire education system. Keeping this in mind, the primary level has been given supreme importance in the Education Policy 2010. Increasing the span and inclusiveness of the primary level, as the developed countries of the world, have been emphasised. Special attention has been given to ensure that no child's access to education is hindered by social and economic status, religion, ethnicity, or gender identity.

The National Curriculum and Textbook Board (NCTB) has implemented an integrated curriculum to update primary education. While this curriculum trails the pedagogy and the curriculum of developed countries, it also adopts traditional teaching-learning values of Bangladesh at the same time. This has enabled the education to be more life-oriented and productive. In the context of globalisation, the mental health of the children has also been specially considered in this curriculum.

Textbook is the most important component of curriculum implementation. NCTB has always borne that in mind while designing textbooks for all levels and classes including primary level. Curriculum goals and objectives have been prioritised in the writing and editing of each book. A keen eye has been kept on the diverse curiosity and capacity of the child's mind. Special importance has been given in designing the curriculum and the textbooks to make teaching-learning interactive and enjoyable. It is hoped that each book will help in the balanced psycho-physical development of children through educational activities. It will support in acquiring the required skills, adaptability, patriotism and moral values at the same time.

Elementary mathematics is a compulsory subject. Explanation, examples and pictures are used to present the content in an easy and simple way for the children. The "Let us do" activities have been incorporated along with examples to create interest among learners and make learning easier. Moreover, the contents of the textbook have been rearranged following the order of easy to hard. There is enough scope for practice in this textbook.

Special thanks to the specialists and teachers who worked intensively in writing, editing and revising the textbook. Thanks to those also who have made the textbook attractive to children through its design and illustration. This textbook, written under the curriculum 2012, has been revised to address the need in the changed context of 2024. Due to time constraints, some errors may still exist. Any constructive advice and guidance from the audience will be considered with due importance.

At the end, I wish every success of the learners for whom the book has been produced.

October 2024

Professor Dr. A K M Reazul Hassan
Chairman
National Curriculum & Textbook Board, Bangladesh

Explanation of Characters and Symbols:

1) Character: A dialogue between two students named Reza and Meena is shown in the textbook. Their dialogues will reflect the four basic operations of arithmetics.

2) Some symbols in the below indicate the steps of their learning.

Key Question: Key concept of the chapter has been expressed through this question.

Activity: To solve a problem students will discuss and think logically with the help of a teacher.

Exercise: Their solution will assess their learning progress.

Contents

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Chapter 1

Multiplication

1.1. Method of Multiplication

(1) Let us multiply 734 by 256.

(2) Let us multiply 8536 by 972.

(1)

	734
	×256
734 × 6	4404
734 × 50	36700
734 × 200	146800
	187904

$734 \times 256 = 187904$

(2)

	8536
	×972
8536 × 2	17072
8536 × 70	597520
8536 × 900	7682400
	8296992

$8536 \times 972 = 8296992$

Multiplicand × Multiplier = Product

Product ÷ Multiplicand = Multiplier

Product ÷ Multiplier = Multiplicand

In symbols, we can write:

□ × △ = ○

○ ÷ □ = △

○ ÷ △ = □

Multiply:

(1) 439 × 328 (2) 853 × 967 (3) 739 × 318

(4) 506 × 294 (5) 417 × 802 (6) 309 × 207

(7) 2148 × 153 (8) 3172 × 898 (9) 6042 × 514

(10) 3407 × 406 (11) 5009 × 602 (12) 8070 × 230

By using the multiplication 78 × 63 = 4914, let us look at the following multiplications.

(1) 780 × 630 (2) 7800 × 630

(1)

(2)

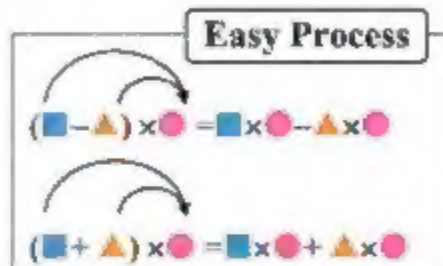
We can also write the multiplication horizontally. Is there any relation of '0' (zero)s in the multiplicand, multiplier and product?

```
      7 8 0 0
    × 6 3 0
    -------
      2 3 4
    4 6 8 0
    -------------
    4 9 1 4 0 0 0
```

Multiply:

(1) 530 × 320	(2) 760 × 910	(3) 400 × 110
(4) 550 × 800	(5) 900 × 700	(6) 4350 × 120
(7) 2100 × 890	(8) 3700 × 600	(9) 7400 × 500
(10) 2000 × 400	(11) 8000 × 700	(12) 6000 × 500

Let us learn to multiply in an easy process.

(1) 999 × 32 (2) 990 × 24 (3) 9900 × 357

(1) 999 × 32 = (1000 – 1) × 32
= ☐ × 32 – ☐ × 32
= ☐ – ☐
= ☐

(2) 990 × 24 = (☐ – 10) × 24 = ☐ × 24 – ☐ × 24
= ☐ – ☐ = ☐

(3) 9900 × 357 = (☐ – 100) × 357
= ☐ × 357 – ☐ × 357
= ☐ – ☐ = ☐

Let us multiply by using easy process.

(1) 101 × 45 (2) 110 × 33 (3) 1100 × 27

Multiply:

(1) 999 × 75 (2) 999 × 99 (3) 990 × 60

(4) 990 × 840 (5) 9900 × 400 (6) 9900 × 99

(7) 101 × 23 (8) 101 × 54 (9) 110 × 220

(10) 1001 × 290 (11) 1010 × 600 (12) 1100 × 200

(13) 1100 × 99 (14) 1010 × 99 (15) 1001 × 999

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1.2. Fill in the blanks.

Put the digits in the blank boxes.

(1)

```
      2 □ □
    × □ 1 8
    -------
    1 8 □ 4
    2 2 8
  1 8 2 4
  ---------
  1 □ □ □ 0 4
```

(2)

```
        5 1 0
    × □ □ □
    ---------
      4 5 9 0
    □ 0 □ □
  □ 5 7 0
  -----------
  3 6 1 5 9 0
```

In (1), I have firstly focused on 2□□ × 10 = 2280. Then I could find all other numbers.

In (2), I have firstly looked at 510 ×□= 4590, and 510 ×□=□570.

1 Put the digits in the blank boxes.

(1)

(2)

(3)

In the case of multiplication on the right, each alphbet indicates a specific digit. Find the digits for A, B and C

Challenge

```
    2 C
  × B A
  -----
  C 4 A
  6 B
  -----
  A A A
```

I have firstly looked at 2C × B = 6B. What digits will come to B and C?

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Exercise 1

1. Multiply:

(1) 123×321	(2) 498×576	(3) 408×203
(4) 3267×245	(5) 8976×956	(6) 3028×417
(7) 2906×801	(8) 4007×809	(9) 7010×140

2. Multiply:

(1) 430×500	(2) 800×900	(3) 4320×190
(4) 6150×820	(5) 3400×700	(6) 6000×900

3. Use the simple method to multiply:

(1) 999×45	(2) 990×60	(3) 990×360
(4) 9900×400	(5) 101×23	(6) 110×290
(7) 1001×78	(8) 1010×560	(9) 1100×900

4. Put the numbers in the blank boxes :

(1)

(2)

```
     9 7 □
  ×    □ 8
  ---------
   □ □ □ 0
   9 □ □
  ---------
 1 7 5 □ 0
```

(3)

5. Villagers have decided to raise a fund to reconstruct the village road. If each of 324 households in the village contributes 250 Taka, how much Taka will there be altogether?

Chapter 2

Division

2.1. Method of Division

Let us divide, 69738 ÷ 245.

```
      2
245)69738
    490
    207
```

Let us consider the first 3 digits from left of 69738 because the divisor 245 is a 3-digit number.
$245 \times 2 = 490$, $245 \times 3 = 735$
Thus, 2 comes to the hundreds place of the quotient. And let us subtract placing 490 according to place value below 697.

```
      28
245)69738
    490
    2073
    1960
     113
```

Let us bring down 3 just right side of the difference according to the picture as shown at the side and let us complete the division by applying this process

```
      284
245)69738
    490
    2073
    1960
     1138
      980
      158
```

Check point :

Let us check the answer by the following formula

Divisor × Quotient + Remainder = Dividend

Divisor 245 × Quotient 284 + Remainder 158

$= 69580 + 158 =$ Dividend 69738 → OK

Quotient 284 and Remainder 158

Note : Remainder < Divisor

Remainder is always smaller than Divisor

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Let us divide : 38500 ÷ 687.

```
       5
687)38500
    3435
     415
```

```
       56
687)38500
    3435
     4150
     4122
       28
```

The number with the first 3 digit of 38500 cannot be divided by 687, so look at the first 4 digits, 3850
687×5 = 3435, 687×6 = 4122
Thus, 5 comes to the tens place of the quotient. Complete the division according to the picture.

In this division, the quotient is 2 digit. We will not make mistake if we arrange the columns neatly by place value

Quotient 56 and Remainder 28

Divisor		Quotient		Remainder		Dividend	
687	×	56	+	28	=	38500	→ OK

Divide:

(1) 83426 ÷ 32 (2) 62685 ÷ 83 (3) 42138 ÷ 203

(4) 33384 ÷ 104 (5) 63500 ÷ 308 (6) 72800 ÷ 520

(7) 23456 ÷ 789 (8) 31160 ÷ 328 (9) 54223 ÷ 607

(10) 34068 ÷ 501 (11) 91500 ÷ 920 (12) 70000 ÷ 840

Check if the following calculation is correct by using the Check point 1 and 2 on the previous page:

(1) 33384 ÷ 124 = Quotient 269 and Remainder 28

(2) 94000 ÷ 203 = Quotient 462 and Remainder 214

(3) 56789 ÷ 418 = Quotient 134 and Remainder 777

2025

Calculate the following divisions.

(1) 2412 ÷ 10 (2) 3264 ÷ 100 (3) 63973 ÷ 100

```
      2 4 1
 1 0 ) 2 4 1 2
      2 0
      -------
        4 1
        4 0
      -------
          1 2
          1 0
      -------
            2
```

```
          3 2
 1 0 0 ) 3 2 6 4
        3 0 0
        -------
          2 6 4
          2 0 0
        -------
            6 4
```

```
            6 3 9
 1 0 0 ) 6 3 9 7 3
        6 0 0
        ---------
          3 9 7
          3 0 0
        ---------
            9 7 3
            9 0 0
        ---------
              7 3
```

Look at the following three boxes. Is there any relation among divisor, quotient, remainder and dividend? Discuss in the classroom.

(1) 2412 ÷ 10 = 241 Remainder 2

(2) 3264 ÷ 100 = 32 Remainder 64

(3) 63973 ÷ 100 = 639 Remainder 73

Circle the quotient and underline the remainder without calculating the divisions, such as:

$$\textcircled{53}\underline{26} \div 100$$

(1) 3872 ÷ 10 (2) 5391 ÷ 100 (3) 98765 ÷ 100

Divide:

(1) 536 ÷ 10 (2) 360 ÷ 10 (3) 4970 ÷ 100

(4) 6400 ÷ 100 (5) 57560 ÷ 100 (6) 92600 ÷ 100

2.2. Problems related to Division

225 employees works in a company. The company gained benefit of 95625 taka in a month and wanted to equally distribute this money among the employees. How much taka will each employee receive?

[Solution]

If we divide 95625 taka equally among 225 people, then

$95625 \div 225 = 425$

Thus, each employee receives 425 taka.

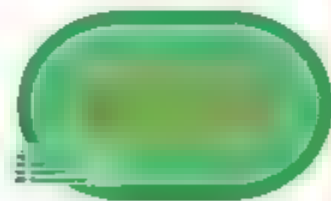
A village committee wants to collect money equally from the villagers to reconstruct a road. There are 367 households in the village and it needs 80000 taka to repair the road. How much taka will each household need to contribute?

[Solution]

If we divide 80000 taka equally among 367 households, then

$80000 \div 367 = 217$ Remainder 361.

If each household pay 217 taka, the amount of money will not be sufficient. Therefore, each householder needs to contribute 218 taka

There is a racetrack that its one round is exactly 800 metres. In which lap of running 10000 metres will be finished? (Answer in an ordinal number.)

[Solution]

If we divide 10000 metres by 800 metres, then

$10000 \div 800 = 12$ Remainder 400

This means that people have to run the track 12 times and 400 metres. Therefore, people finish running in the 13th lap to cross 10000 metres.

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Exercise 2

1. Divide:

(1) $57249 \div 228$	(2) $43932 \div 523$	(3) $32637 \div 303$
(4) $20387 \div 406$	(5) $53352 \div 702$	(6) $49800 \div 230$
(7) $54001 \div 907$	(8) $30000 \div 420$	(9) $12300 \div 300$
(10) $35000 \div 700$	(11) $48000 \div 800$	(12) $73300 \div 600$

2. Check if the following calculations are correct or not
   (1) $29845 \div 293$ = Quotient 101 and Remainder 282
   (2) $39493 \div 321$ = Quotient 123 and Remainder 10
   (3) $97500 \div 186$ = Quotient 523 and Remainder 222

3. Divide:

(1) $695 \div 10$	(2) $2820 \div 10$	(3) $6235 \div 100$
(4) $9400 \div 100$	(5) $54826 \div 100$	(6) $85200 \div 100$

4. There are 98000 grams of rice at a home. If 650 grams of rice are eaten every day, when will the rice finish? (Answer in an ordinal number.)

5. 128 pieces of papers are necessary to prepare one book. How many books can be prepared by 60000 pieces of papers?

6. A company gained profit of 95200 taka in business, and wanted to equally distribute this money to its employees. If 800 taka was given to each employee, how many employees they have?

7. A person saves money 850 taka in every month. In which month his saving will exceed 50000 taka? (Answer in an ordinal number.)

8. Every 250 products are packed in one cardboard box. In order to pack 43548 products, how many boxes will be necessary?

Chapter 3

Problems of Four Basic Operations

3.1. Use of Brackets

Do the following calculations by using brackets.

$3 + \{(14 - 10) \times (20 - 15) + 30\} \div 25 - 4$

Rules of using Brackets

Rule 1	Calculate from left to right.
Rule 2	Do division first then multiplication, and then do addition and subtraction
Rule 3	Calculate inside the brackets first Start from the first bracket( ) ,then the second bracket { }, and the third bracket [ ].

Solution:

$$
\begin{aligned}
3 + \{(14 - 10) \times (20 - 15) + 30\} \div 25 - 4 \\
&= 3 + \{4 \times 5 + 30\} \div 25 - 4 && \text{Rule 3} \\
&= 3 + \{20 + 30\} \div 25 - 4 && \text{Rule 2} \\
&= 3 + 50 \div 25 - 4 && \text{Rule 3} \\
&= 3 + 2 - 4 && \text{Rule 2} \\
&= 1 && \text{Rule 1}
\end{aligned}
$$

Do the following calculations by using the above rules.

(1) $6 - (56 - 40)$ [illegible] $(2 \times 4) + 5$

(2) $7 + [\{45 \div 9 + 3\} \times \{(12 - 7) \times 2 - 5\} - 1] \div 13$

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Do the following calculations.

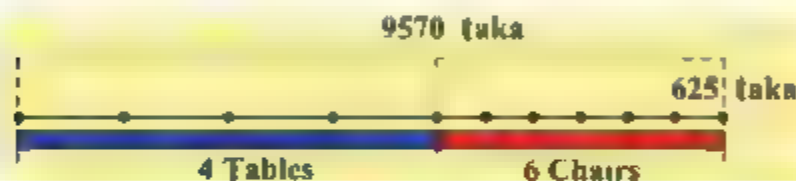
(1) $12 \div (2 \times 3)$ (2) $12 \div 2 \times 3$

(3) $\{24 - (3 \times 4)\} \div 2$ (4) $24 - 3 \times 4 \div 2$

The answer is completely different if we use brackets, isn't it?

Express the following question in one mathematical sentence using brackets, and solve the problem.

Question:

The total price of 6 chairs and 4 tables is 9570 taka The price of one chair is 625 taka What is the price of one table?

Mathematical sentence: $\{9570-(625\times6)\}\div4$

Calculate:

(1) $(24 - 18) \div 3 + 8$ (2) $5 - (36 - 10) \div 13$

(3) $300 - (18 \times 5 + 45 \times 3)$ (4) $8 - \{(24 + 12) \div 18 + 4\}$

(5) $\{(32 - 14) \times 6 - 84\} \div 12$ (6) $\{9 - (45 \div 9 - 3) \times 2\} - 5$

(7) $[\{10 \times (12 \div 4 - 1) - 2\} - \{(6 \times 6 - 6) \div 2\}] \div 3$

Express the following question in one mathematical sentence using brackets, and solve the problem.

Question:

The total price of 12 biscuits and 30 candies is 192 taka. The price of one biscuit is 6 taka. What is the price of one candy?

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3.2. Problems of four basic operations

There were 4687 people in a village in the last year. In this year 349 people moved in and 280 people moved out of the village. How many people are there in this year?

The figure helps us to understand the problem.

[Solution]

4687 + 349 − 280 = 4756

People: 4756

In a market prawn fish is sold at 480 taka per kg and cat fish at 550 taka per kg. If we buy 3 kg of prawn fish and 2 kg of Horn fish and pay 3000 taka, how much will be the change?

[Solution 1]

Prawn fish 480 × 3 = 1440
Cat fish: 550 × 2 = 1100
Total. 1440 + 1100 = 2540
Change: 3000 − 2540 = 460

Change 460 taka

[Solution 2]

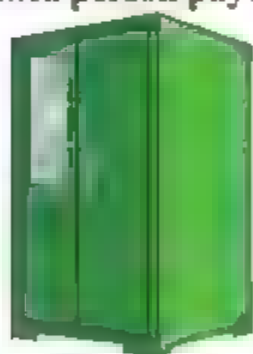
3000 − (480 × 3 + 550 × 2)
= 3000 − 2540
= 460

Change 460 taka

2025

Mr Altaf's monthly salary is 9870 taka. Every month he spends 3800 taka on house rent and 5650 taka on household expenses. He saves the remaining money in a bank. What amount of money does Mr. Altaf save in a year ?

5 litres of water come into a water tank in a minute, but 2 litres of water go out of the tank per minute. How many litres of water will there be in a tank in 10 minutes of opening of the both taps together?

Tarik, Joshim and Halim went to a furniture shop. They bought 1 almirah, 2 tables and 8 chairs below and shared the payment equally among 3 people. How much taka did each person pay?

8700 taka | 2100 taka | 750 taka

[Solution]

$(8700 \times 1 + 2100 \times 2 + 750 \times 8) \div 3$
$= (8700 + 4200 + 6000) \div 3$
$= 18900 \div 3$
$= 6300$

Each Person paid 6300 taka

5 people went to the above furniture shop. They bought 2 almirahs, 3 tables and 12 chairs at the rate of previous picture and shared the payment equally among them. How much taka would each person pay?

2025

Meena and Rina together have 7532 taka. Meena has 560 taka more than Rina. How much money does each of Meena and Rina have ?

7532 Taka
? Taka
560 Taka
Rina
Meena

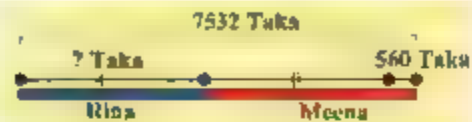
[Solution]

Rina's money is a half of $(7532 - 560)$ taka. Thus,

$(7532 - 560) \div 2 = 6972 \div 2 = 3486$ taka

Meena has 560 taka more than Rina. Thus, Meena has

$3486 + 560 = 4046$ taka

Rina 3486 taka, Meena 4046 taka

Check the answer
$3486 + 4046 = 7532 \rightarrow$ OK!

The sum of ages of a father and his daughter is 80 years. Father's age is four times the age of the daughter. What are their ages?

80 years old
Daughter
Father

[Solution]

From the figure above, the age of the daughter is:

$80 \div 5 = 16$

The father's age is thus, $16 \times 4 = 64$

Daughter 16 years old, Father 64 years old

Moli and Raju together have 8580 taka. Moli has 480 taka less than Raju. How much money does each of Moli and Raju have?

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3.3. Unitary Method

The price of 8 eggs is 72 taka. We buy 15 pieces of egg. How much do we pay?

[Solution]

The price of 8 eggs is: 72 taka
The price of 1 egg is: $72 \div 8 = 9$ taka
The price of 15 eggs is: $9 \times 15 = 135$ taka

Total: 135 taka

If the price of 4 pens is 80 taka, how much is the price of 10 pens?

A factory can produce 2450 motorcycles in 5 days. How many motorcycles can it produce in 4 weeks?

Meena walks 200 metres in 4 minutes. How long can she walk in half an hour?

2025

Aysha bought 8 pencils at 64 taka. How much will she pay if she buys 24 pencils?

[1] Consider the problem with using the following table.

(1) Fill in the blanks.

Pencils	1	2	3	4	6	8	10	12	16	20	24	32	40
Price						64							

(2) Find the price of 24 pencils.

$64 \div 8 = 8$ $8 \times 24 = 192$ 192 taka

[2] Let's examine the relationship between the quantities in the table.

(1) If the number of pencils is 3 times more, then how will the price change?

(2) If the price becomes half, then how will the number of pencils change?

Pencils	1	2	3	4	6	8	10	12	16	20	24	32	40
Price	8	16	24	32	48	64	80	96	128	160	192	256	320

If we buy 64 pencils in the above question, how much will it cost? (Use the fact that 32 pencils cost 256 taka.)

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Exercise 3

1. Calculate:

(1) $(42 - 15) \div 9 + 2$

(2) $500 - (125 \times 3 + 18 \times 6)$

(3) $\{(8 \times 8 - 7 \times 9) \times 40 - 6\} \div 17$

(4) $15 - \{(56 + 39) \div 19 + 8\}$

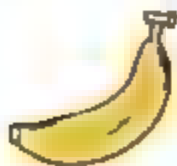
(5) $[\{4 \times (28 \div 7 + 1) - 3\} - \{(5 \times 7 - 29) \div 3\}] \div 3$

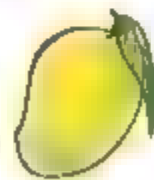
2. The price of 12 plates and 20 cups is 3920 taka. The price of one cup is 145 taka. What is the price of one plate?

3. A stationery shop sells a notebook at 18 taka, pencil at 8 taka, and set squares at 25 taka. If we buy 4 notebooks, 8 pencils and 2 set squares, and pay 500 taka, how much will be the change?

4. In a bazar, Zahidul Hasan bought 40 kg of rice, Soyabean oil for 265 taka and fish for 588 taka. The rice costs 38 taka per kilogram. He gave 3000 taka to the shopkeeper. What amount will the shopkeeper refund him?

5. The price of 2 cows and 3 goats together is 45080 taka. The price of 1 goat is 4560 taka. What is the price of 1 cow?

6. Tarik, Joshim and Halim went to a fruit shop. They bought 6 bananas, 3 oranges, and 9 mangoes that are shown below, and shared the payment equally among them. How much Taka did each person pay?

10 taka

12 taka

25 taka

7. Mr. Jalal's monthly salary is 8765 taka. Every month he spends 3225 taka on house rent and 4850 taka on other items, and he saves the rest of the money in a bank. What will be his saving in 8 months?

8. Farida and Fatema's salary is 19950 taka in total. Fatema gets 2450 taka more than Farida. How much does each of them get ?

9 Raju and Rony together have 690 litchis. Rony has 86 litchis less than Raju. How many litchis does each of them have?

10. The sum of ages of a mother and her son is 60 years. Mother's age is 3 times the age of the son. What are their ages?

11. The divisor is 78, the quotient is 25 and the remainder is one-third of the divisor. What is the dividend ?

12. The dividend is 8903, the divisor is 87 and the remainder is 29. What is the quotient?

13. A factory can produce 2520 bi-cycles in 7 days. How many bi-cycles can it produce in 3 weeks?

14. Aysha bought 3 notebooks at 72 taka. How much will she pay if she buys 12 notebooks?

15. If 8 kg of polao rice costs 960 taka, how many kilograms of polao rice can be bought by 4800 taka?

16. A motorcycle can travel 300 km by 12 litre of petrol How many litres of petrol will be necessary to travel 100 km?

Chapter 4

Mathematical Symbols

4.1. Mathematical Symbols

Choose an appropriate symbol from <, =, and > for the following blank boxes.

(1) $5 + 3 - 2 \ \square \ 5 + 5 - 2$

(2) $4 \times 7 \div 2 \ \square \ 4 \times 6 \div 3$

(3) $\{(13 + 5) \div 3\} - 4 \ \square \ 2 + \{(9 - 6) \times 4 - 12\}$

Choose an appropriate symbol from +, –, ×, and ÷ for the following blank boxes.

(1) $12 \ \square \ 4 \ \square \ 2 = 1$

(2) $6 \ \square \ 6 \ \square \ 12 = 24$

(3) $9 \ \square \ 9 \ \square \ 9 \ \square \ 9 = 80$

Choose an appropriate symbol from <, =, and > for the following blank boxes.

(1) $12 \div 3 + 4 \times 5 \ \square \ 12 \times 3 + 4 + 5$

(2) $48 \div (8 \times 2 \quad 4) \ \square \ 48 \times 8 \div 2 \quad 4$

2025

4.2. Open sentence

A sentence is called "open" when we do not know whether it is true or false. On the other hand, a sentence is "mathematical sentence (closed)" if it can be determined to be true or false.

Examples:

- 8 is an even number. → This is a mathematical sentence, and it is true.
- 9 is an even number. → This is a mathematical sentence, and it is false
- x is an even number → This is an open sentence, because it could be true or false, depending on the value of x.

Express the following sentences in mathematical sentences, and identify open sentences and mathematical sentence.

(1) Adding x to 5 equals 12.
(2) Multiplying 3 by 4 equals 12.
(3) Dividing 26 by 4 equals 5.
(4) Putting □ and △ together makes 10.

We can use □ and △ for unknown numbers.

Find the value of x that makes the sentence true.

(1) $x + 5 = 10$
(2) $48 - x = 23$
(3) $x \times 2 = 36$
(4) $72 \div x = 6$

Determine the unknown values in the following open sentences so that it becomes true.

(1) A triangle has x sides.
(2) A square has y corners.
(3) Receiving 45 Taka after paying 100 Taka for x Taka's item.
(4) Giving 4 biscuits by dividing y biscuits among 15 people

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4.3. Solving Problems Using Letters

A pencil and an eraser are sold at 6 Taka and 8 taka, respectively. We bought x pieces of pencils with one eraser and paid y taka. Express this in a mathematical sentence.

The price of x pieces of pencils: ➔ □ × □

The total price: ➔ □ × □ + □ = □

When the value of x is 5, 10, 15, and 20, what will be the value of y ? Calculate the value of y and fill in the box below.

x (pencil)	5	10	15	20
y (taka)				

One book weighs 240 grams. Hakim bought some copies of this book, and put each of them in a box of 500 grams. Let x denote the number of books and y the total weight.

(1) Write the relationship between x and y.

(2) Find the values of y when x is 10, 20, and 30.

In the above key question, the price for x pencils and one eraser was 50 taka. Find the value of x.

As $y = 50$ in the above sentence, we have:
$6 \times x + 8 = 50$

As in the box below, we know
$\square + 8 = 50 \Rightarrow \square = 50 - 8$,
Therefore, the value of x is...

Relationship between addition and subtraction

$\square + \triangle = \bigcirc \Leftrightarrow$ $\square = \bigcirc - \triangle$

Examples
$5 + 7 = 12 \Leftrightarrow 5 = 12 - 7$
$8 + 6 = 14 \Leftrightarrow 6 = 14 - 8$

Relationship between multiplication and division

$\square \times \triangle = \bigcirc \Leftrightarrow \square = \bigcirc \div \triangle$

Examples
$3 \times 2 = 6 \Leftrightarrow 3 = 6 \div 2$
$9 \times 4 = 36 \Leftrightarrow 4 = 36 \div 9$

When the value of y in the above question is as follows, find the value of x.

(1) $y = 62$ (2) $y = 98$ (3) $y = 140$

Determine the value of x so that the following mathematical sentence becomes true.

(1) $7 + x = 13$ (2) $x - 4 = 18$
(3) $8 \times x = 32$ (4) $x \div 9 = 3$
(5) $3 \times (5 + x) = 18$ (6) $(x + 5) \times 4 = 28$

A bottle of water weighs 120 grams. Meena put several bottles of this water in a bag of 50 grams. Let x denote the number of bottles and y the sum of weights of water bottles and weight of bag.

(1) Write a mathematical sentence to show the relationship between x and y.
(2) Find the value of y when x is 10.
(3) Find the value of x when y is 770.

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Exercise 4

1. Express the following sentences in mathematical sentences, and identify open and mathematical sentences.
   (1) Multiplying 9 by 7 equals 80.
   (2) Subtracting x from 42 equals 35
   (3) Dividing 120 by 40 equals 3.

2. Determine the unknown values in the following open sentences so that it becomes true
   (1) A triangle has x sides.
   (2) Receiving 23 taka after paying 50 taka for x taka's item

3. There are square shaped papers whose side is equal to x cm
   (1) Write the perimeter of this square paper.
   (2) Write the total area of 3 pieces of this square.

4. Find the value of x that makes the following mathematical sentence true

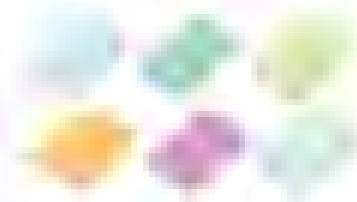
   (1) $x + 9 = 15$ (2) $x - 12 = 25$
   (3) $2 \times x = 22$ (4) $x \div 8 = 7$
   (5) $7 \times (8 + x) = 63$ (6) $(x - 4) \div 6 = 6$

5. The price of x packets of biscuits with one bottle of drink was y Taka. A packet of biscuit costs 18 Taka and a bottle of drink 12 Taka.
   (1) Write a mathematical sentence to show the relationship between x and y.
   (2) Find the value of y when x is 10.
   (3) Find the value of x when y is 120.

Chapter 5

Multiples and Factors

5.1. Multiples

A teacher wants to distribute 3 sheets of paper to each student. Find the necessary number of sheets when the number of students is 1, 2, 3

Fill in the blank boxes in the following table and discuss what numbers come to the boxes.

Number of students	1	2	3	4	5	10	20	30	40	50
Number of papers	3	6								

The number obtained by multiplying 3 by whole numbers are called 3's multiplies. A multiple of 3 can be divided by 3 without a remainder.

N's multiple = A number multiplying N by a whole number

(1) Circle 4's multiples in the first line below.
(2) Circle 6's multiples in the second line below.

4's Multiples

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

6's Multiples

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Write 10 multiples :

(1) 5 (2) 7 (3) 8 (4) 9

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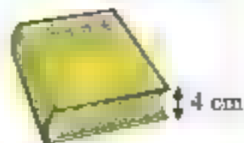
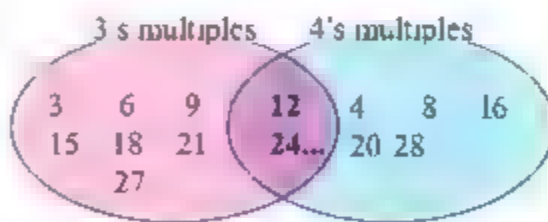
5.2. Least Common Multiple (LCM)

We pile up some encyclopaedias and dictionaries. The thicknesses of each encyclopaedia and dictionary are 4 cm and 3 cm, respectively. In what centimetres the heights of those books will be the same?

Encyclopaedia

Dictionary

Fill in the blanks in the following table and circle the numbers that appear in both of Encyclopaedia and Dictionary.

Number of books	1	2	3	4	5	6	7	8	9	10	11	12
Encyclopaedia (cm)	4	8	(12)	16								
Dictionary (cm)	3	6	9	(12)								

The numbers 12, 24, … appear in both of 3's and 4's multiples, and are called **'common multiples** of 3 and 4'. The smallest number among the common multiple is called the **'Least Common Multiple'** or **LCM.**
The LCM of 3 and 4 is 12.

Look at the number lines in the previous page, and answer the following questions.

(1) Write 3 common multiples of 4 and 5.
(2) Write the LCM of 4 and 5.

Write the multiples of 2 and 3 up to 30 :

(1) Find 5 common multiples of 2 and 3.
(2) Find the LCM of 2 and 3.

2's multiple:

3's multiple:

Find the LCM :

(1) 4 and 5 (2) 6 and 9 (3) 3 and 6

What relationship can you find between common multiples and the LCM?

Common multiples of 2 and 3 → 6, 12, 18, ...
Common multiples of 3 and 4 → 12, 24, 36, ...
Common multiples of 4 and 6 → 12, 24, ...

→ **Common multiples are __________ of the LCM.**

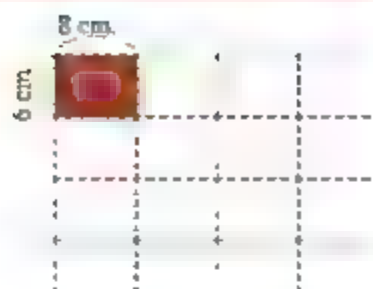
Discuss how to find the LCM of 4, 6 and 9.

4's multiple:	4	8	12	16	20	24	28	32	36	40
6's multiple:	6	12	18	24	30	36	42			
9's multiple:	9	18	27	36	54					

Find the LCM :

(1) 2, 3, 4 (2) 3, 4, 5 (3) 2, 4, 8

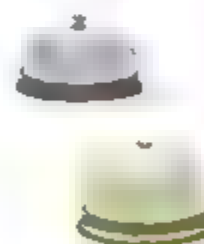
5.3. Use of LCM

There are some tiles whose length is 8 cm and width is 6 cm. We want to make a square by paving them on a floor. Find the length of a side of the smallest square.

Observe how the length and width changes when we pave the tiles.

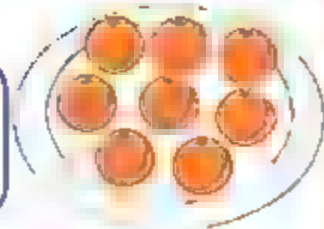
Number of tiles	1	2	3	4	5	6	7	8
Width (cm)	8	16	(24)	32				
Length (cm)	6	12	18	(24)				

➔ **The length of a side of the smallest square is ______ cm.**

1 **In the above question,**
(1) How many tiles are necessary to make the smallest square?
(2) What is the length of a side of the second smallest square?

2 **There are two bells. One of them rings every 12 minutes and the other rings every 5 minutes. If they ring together at 3 pm, what time will they ring together next time?**

3 **Buses of Company A departs a bus station every 15 minutes and Buses of Company B departs the same bus station every 25 minutes. If they depart the bus station at 8:45 am together, what time will they depart together next time?**

5.4. Factors

A teacher wants to distribute equally 8 oranges to students. To how many students can he distribute oranges?

Fill out the blank boxes in the following table and discuss what numbers come to the boxes.

Number of students	1	2	3	4	5	6	7	8
Number of orange	8	4	×					

The numbers that can divide 8 without remainder are called 8's factors.
The factors of 8 are 1, 2, 4, and 8.
The factors always includes 1 and itself.

N's factor is the number that can divide N without remainder

Circle the factors in the following table.

9's factors	1 2 3 4 5 6 7 8 9
12's factors	1 2 3 4 5 6 7 8 9 10 11 12
17's factors	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
20's factors	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
24's factors	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

1 **Write the factors :**

(1) 7 (2) 15 (3) 18
(4) 23 (5) 36 (6) 39
(7) 42 (8) 47 (9) 56

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5.5. Greatest Common Factors (GCF)

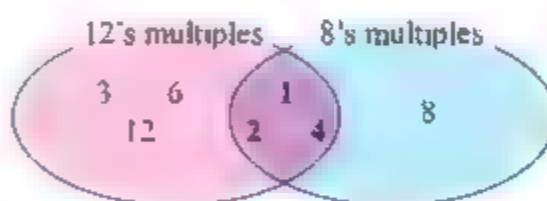
There are 12 apples and 8 bananas. Find the number of students that the teacher can divide these fruits equally.

If there are 2 students, each student will equally get 6 apples and 4 bananas

Fill out the blanks in the following table and find the numbers that can divide the number of both apples and bananas

Students	1	2	3	4	5	6	7	8	9	10	11	12
Apples	12	6	4									
Bananas	8	4	×						×	×	×	×

The numbers 1, 2, and 4 that can divide both 12 and 8, are called **'common factors** of 12 and 8'. The largest number among the common factors is called the **'Greatest Common Factor'**, or **GCF**

The GCF of 12 and 8 is 4.

Use the following table to find the factors and GCF of 18 and 24.

18's factors	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
24's factors	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

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Find all the common factors and the GCF :

(1) 12 and 15 (2) 18 and 45 (3) 28 and 56

(4) 36 and 48 (5) 54 and 32 (6) 52 and 39

Find the GCF of 15 and 16.

In some cases, 1 is the only common factor.

What relationship can we find between common factors and the GCF?

Common factors of 8 and 12 → 1, 2, 4
Common factors of 12 and 18 → 1, 2, 3, 6
Common factors of 12 and 15 → 1, 3

→ **Common factors are ___________ of the GCF.**

Discuss how to find the GCF of 40, 24, and 56.

40's factors:	1	2		4	5			8	10		20			40
24's factors:	1	2	3	4		6		8		12		24		
56's factors:	1	2		4			7	8		14		28		56

Find the GCF of the following numbers.

(1) 12, 33, 24 (2) 39, 26, 52 (3) 12, 24, 36

5.6. Use of GCF

There is a graph paper of 12 cm in width and 18 cm in length. We cut this paper into some squares of the same size without leaving any remaining parts. Find the length of a side of the largest square.

Use the sheet on the right to see whether we can divide it into squares whose side is 2 cm, 3 cm, 4 cm, ... in length, without any remaining parts.

1. **In the above question, how many squares of the largest size can we make from this graph paper?**

2. **The teacher divides 40 boys and 24 girls into groups without any remaining students, so that all the groups have the same number of boys and girls. Find the maximum number of groups and the number of boys and girls in each group .**

3. **The teacher wants to divide 60 pencils and 36 notebooks equally among students without leaving any remainders. Find the maximum number of students to whom the teacher can distribute these items equally.**

5.7. Prime Factorisation

If the factors of a number is 1 and itself (only 2), then it is called a **prime number**. Examples- 2, 3, 5, 7, 11, 13, 17, 19, etc., are prime numbers

1 is not a prime number because it has only one factor 1

Which of the following numbers are not prime numbers? Why?

4 9 21 33 37 43 49 57 59 63 67

If a number is not prime, then it can be expressed as the product of prime numbers. For example,

$4 = 2 \times 2$	$6 = 2 \times 3$	$8 = 2 \times 4$ $= 2 \times 2 \times 2$	$24 = 2 \times 12$ $= 2 \times 2 \times 6$ $= 2 \times 2 \times 2 \times 3$

This process is called **prime factorisation,** and each factor is **called a prime factor.**

Express the following numbers as the product of prime numbers.

(1) 12 (2) 24 (3) 35 (4) 45 (5) 26

Way of prime factorization

$$\begin{array}{r|r} 2 & 12 \\ \hline 2 & 6 \\ \hline & 3 \end{array} \qquad \begin{array}{r|r} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline & 3 \end{array}$$

Multiply Multiply

Divide the number by prime numbers 2, 3, ... etc and express it as the product of these prime numbers.
$12 = 2 \times 2 \times 3$,
$24 = 2 \times 2 \times 2 \times 3$

2025

Find the least common multiple of 30 and 45.

Way to find the LCM

[1] Divide by common prime factors

$$\begin{array}{r|rr} 3 & 30 & 45 \\ 5 & 10 & 15 \\ \hline & 2 & 3 \end{array}$$

[2] Multiply all the factors

$3 \times 5 \times 2 \times 3 = 90$

This result is the same with my answer
30's multiples: 30 60 (90)
45's multiples: 45 (90)

Find the least common multiple of 15 and 16.

➔ **If the numbers do not have any common prime factors, then their LCM is the ______________ of these numbers.**

Find the least common multiple of 18, 12 and 14.

Way to find the LCM of many numbers

[1] Divide by common prime factors.
[2] If there is no prime factor that divide all the numbers, find a prime number that divides at least two numbers.
[3] Move undivided number down to the next
[4] Multiply all the factors: $2 \times 3 \times 3 \times 2 \times 7 = 252$
This is the LCM of 18, 12 and 14.

$$\begin{array}{r|rrr} 2 & 18 & 12 & 14 \\ 3 & 9 & 6 & 7 \\ \hline & 3 & 2 & 7 \end{array}$$

1 **Find the LCM :**

(1) 4, 6 (2) 8, 10 (3) 3, 5
(4) 12, 15 (5) 24, 36 (6) 35, 32
(7) 12, 8, 10 (8) 6, 9, 12 (9) 14, 21, 18
(10) 16, 24, 15, 28 (11) 7, 10, 12, 14

2025

Find the greatest common factor of 30 and 45.

Way to find the GCF

[1] Divide by common prime factors

$$\begin{array}{r|rr} 3 & 30 & 45 \\ 5 & 10 & 15 \\ & 2 & 3 \end{array}$$

[2] Multiply all the common factors

$3 \times 5 = 15$

Compare and check the answer!

30's factors. 1, 2 3 5, 15 30
45's factors 1, 3, 5, 9, 15 45

Find the greatest common factor of 15 and 16.

➔**If the numbers do not have any common prime factors, then the GCF of these numbers is _____.**

Find the greatest common factor of 56, 28 and 42

Way to find the GCF of some numbers

[1] Divide by the common prime factors of all these numbers.

[2] Stop the division when no common factor for all the numbers is found.

[3] Multiply all the common factors: $2 \times 7 = 14$. This is the GCF of 56, 28 and 42

$$\begin{array}{r|rrr} 2 & 56 & 28 & 42 \\ 7 & 28 & 14 & 21 \\ & 4 & 2 & 3 \end{array}$$

Find the GCF :

(1) 8, 6 (2) 12, 10 (3) 9, 16

(4) 32, 24 (5) 36, 45 (6) 105, 140

(7) 18, 30, 24 (8) 32, 64, 40 (9) 35, 21, 28

(10) 39, 26, 52, 24 (11) 25, 26, 27, 30

2025

Exercise 5

1. Find the LCM :

   (1) 15, 21   (2) 35, 21   (3) 20, 12, 25

   (4) 9, 16, 18   (5) 20, 12, 25, 32

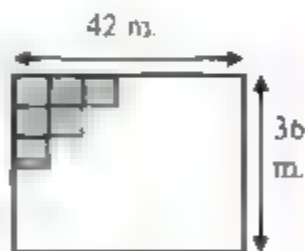
2. Find the GCF :

   (1) 12, 18   (2) 24, 28   (3) 39, 52

   (4) 54, 36, 72   (5) 20, 30, 36, 45

3. Some trees and lamp posts are set along a street. Trees are planted every 25 metres while lights are set every 20 metres. If trees and lamp posts are set together at the beginning of the street, in every how many metres are the trees and lamp posts are set together again?

4. There are three bells of different colours. The red bell rings every 18 minutes, the yellow bell rings every 15 minutes, and the green bell rings every 12 minutes. If they ring together at 6 pm, what time will they ring together next time?

5. There is a rectangular-shape room as shown on the right. We want to pave square-shape carpets on the floor of this room without leaving any space.

   (1) Find the length of the side of the largest square-shape carpet that can pave the floor.

   (2) How many such carpets are necessary to pave the floor?

6. There are more than 10 students. The teacher wants to equally distribute 42 bananas, 84 biscuits and 105 candies to these students without leaving any remainders. To how many students can the teacher distribute the bananas, biscuits and candies?

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Chapter 6

Fractions

6.1.Proper fraction

Answer the questions.

1. Find **proper fractions** and **fractions equal to 1** in the box

$$\frac{2}{3}, \frac{4}{4}, \frac{5}{8}, \frac{13}{12}, \frac{27}{26}, \frac{1}{1}, \frac{2}{25}$$

2. Arrange the following fractions from smaller to larger and show it using symbols.

(1) $\frac{6}{7}, \frac{3}{7}, \frac{7}{7}, \frac{2}{7}$ (2) $\frac{2}{7}, \frac{2}{5}, \frac{2}{4}, \frac{2}{2}$

3. Find the missing numbers.

(1) $\frac{1}{3} = \frac{\square}{6}$ (2) $\frac{4}{5} = \frac{12}{\square}$ (3) $\frac{3}{6} = \frac{\square}{2}$ (4) $\frac{12}{54} = \frac{2}{\square}$

4. Reduce the following fractions to the lowest term

(1) $\frac{6}{12}$ (2) $\frac{3}{21}$ (3) $\frac{8}{12}$ (4) $\frac{9}{15}$ (5) $\frac{24}{40}$

5. Convert fractions into ones with common denominators.

(1) $\left[\frac{1}{3}, \frac{1}{4}\right] \rightarrow \left[\quad\right]$ (2) $\left[\frac{2}{3}, \frac{1}{2}\right] \rightarrow \left[\quad\right]$ (3) $\left[\frac{1}{3}, \frac{2}{5}\right] \rightarrow \left[\quad\right]$

6. Do addition and subtraction.

(1) $\frac{1}{4} + \frac{1}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$ (2) $\frac{1}{3} + \frac{1}{6} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square} = \frac{\square}{\square}$

(3) $\frac{1}{2} - \frac{1}{3} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$ (4) $\frac{1}{2} - \frac{1}{6} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square} = \frac{\square}{\square}$

6.2. Improper and mixed fraction

Express the amount of ruti with fraction.

This amount has seven $\frac{1}{4}$s.

$$\frac{4}{4}+\frac{3}{4}=\frac{7}{4}$$

Numerator 7 is larger than denominator 4.

$\frac{7}{4}$ is a improper fraction.

On the other hand,

This is '1 and $\frac{3}{4}$' and can be written as $1\frac{3}{4}$

'one and three forth (one and three-quarters)'

$$\frac{7}{4}=1\frac{3}{4}$$

An integer and a proper fraction together make a mixed fraction.

Proper fraction	Improper fraction	Mixed fraction
Smaller → 2 Larger → 5 ($\frac{2}{5}$)	Larger (or equal) → 7 Smaller (or equal) → 5 ($\frac{7}{5}$)	Integer → $1\frac{2}{5}$ ← Proper fraction

Same amount can show either an improper fraction or a mixed fraction.

Fill in the blanks by writing proper and improper fractions above the number line and mixed fractions below the number line.

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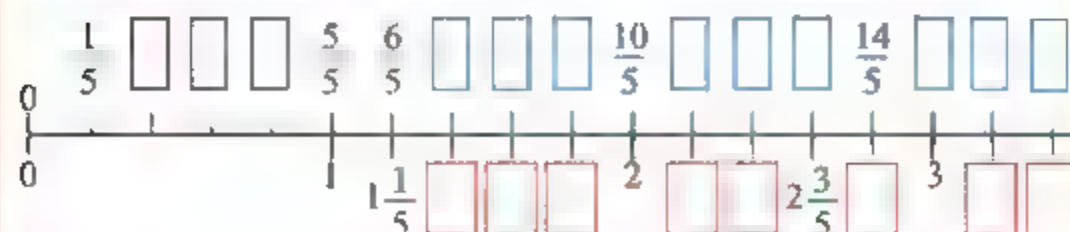
Change the following mixed fractions into improper fractions

(1) $2\frac{1}{4}$ (2) $1\frac{2}{3}$ (3) $3\frac{3}{5}$

Colour and find the answer

(1) $2\frac{1}{4}$

(2) $1\frac{2}{3}$

(3) $3\frac{3}{5}$

To convert a mixed fraction into an improper fraction
1. Multiply the integer part by the denominator and add it to the numerator then put the number as numerator
2. The denominator will remain same

Change the following improper fractions into mixed fractions or integers

(1) $\frac{9}{4}$ (2) $\frac{6}{3}$ (3) $\frac{16}{5}$

Looking at the numerator, 9 consists of two 4s and 1.

$9 \div 4 = 2$ Remainder 1

$\frac{9}{4} = \square\frac{\square}{4}$

Colour and find the answer.

(1) $\frac{9}{4}$

(2) $\frac{6}{3}$

(3) $\frac{16}{5}$

To convert an improper fraction into a mixed fraction
1. Divide the numerator by the denominator
2. Write down the quotient on the integer part and remainder as the numerator
3. Denominator will remain same.

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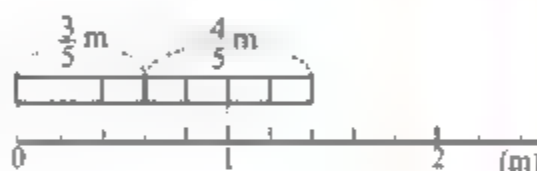
1 Express in improper fractions:

(1) $3\frac{1}{2}$ (2) $2\frac{5}{6}$ (3) $4\frac{4}{9}$ (4) $3\frac{5}{8}$ (5) $2\frac{7}{10}$

2 Express in mixed fractions or integers:

(1) $\frac{7}{5}$ (2) $\frac{8}{4}$ (3) $\frac{22}{7}$ (4) $\frac{35}{8}$ (5) $\frac{40}{10}$

There are $\frac{3}{5}$ m and $\frac{4}{5}$ m strings, how many metres altogether?

Mathematical sentence:

Calculation: $\frac{3}{5} + \frac{4}{5} = \frac{\square}{\square}$

Total: $\frac{\square}{5}$ m or $\square\frac{\square}{5}$ m

3 Calculate:

(1) $\frac{4}{5} + \frac{4}{5}$ (2) $\frac{4}{6} + \frac{3}{6}$ (3) $\frac{13}{9} + \frac{6}{9}$ (4) $\frac{10}{7} + \frac{12}{7}$

(5) $\frac{9}{8} + \frac{7}{8}$ (6) $\frac{7}{5} - \frac{4}{5}$ (7) $\frac{9}{7} - \frac{6}{7}$ (8) $\frac{14}{9} - \frac{7}{9}$

(9) $\frac{11}{6} - \frac{5}{6}$ (10) $\frac{17}{8} - \frac{9}{8}$

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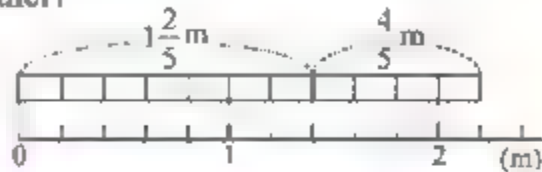
There are two strings of $1\frac{2}{5}$ m and $\frac{4}{5}$ m, how many meters of strings are there altogether?

Mathematical sentence:

I solve it by thinking of $1\frac{2}{5}$ as $1+\frac{2}{5}$

I solve it by changing the mixed fraction into an improper fraction.

$$1\frac{2}{5}+\frac{4}{5} = 1+\frac{2}{5}+\frac{4}{5}$$
$$= 1+\frac{\square}{5}$$
$$= 1+1+\frac{1}{5} = \square\frac{1}{5}$$
$$= 2\frac{1}{5}\text{ m}$$

$$1\frac{2}{5}+\frac{4}{5} = \frac{\square}{5}+\frac{4}{5}$$
$$= \frac{\square}{5}$$
$$\frac{11}{5}\text{ m}$$

$2\frac{1}{5} = \frac{11}{5}$ so the answer is same

A calculation of mixed fraction is not simple because we have to focus on integer and numerator many times.

But it is easier to understand mixed fractions. Because $2\frac{1}{5}$ is easier than $\frac{11}{5}$

4 Calculate:

(1) $1\frac{2}{5}+\frac{1}{5}$ (2) $1\frac{2}{3}+\frac{2}{3}$ (3) $1\frac{4}{6}+\frac{3}{6}$ (4) $\frac{4}{5}+1\frac{3}{5}$ (5) $\frac{2}{9}+1\frac{7}{9}$

(6) $1\frac{3}{5}\quad\frac{2}{5}$ (7) $1\frac{1}{3}\quad\frac{2}{3}$ (8) $1\frac{3}{7}\quad\frac{4}{7}$ (9) $2\frac{4}{9}\quad\frac{5}{9}$ (10) $3\quad\frac{2}{3}$

Do addition and subtraction and explain how to calculate them.

(1) $2\frac{1}{3} + 1\frac{1}{6}$ (2) $3\frac{2}{3} - 1\frac{5}{12}$

(1) $2\frac{1}{3} + 1\frac{1}{6} = \frac{7}{3} + \frac{7}{6}$

$= \frac{14}{6} + \frac{7}{6}$

$= \frac{\overset{7}{\cancel{21}}}{\underset{2}{\cancel{6}}}$

$= \frac{7}{2}$

Mixed fraction → Improper fraction
Change into the common denominator
Reduce it to the lowest term.

(2) $3\frac{2}{3} - 1\frac{5}{12} = \frac{11}{3} - \frac{17}{12}$

$= \frac{44}{12} - \frac{17}{12}$

$= \frac{\overset{9}{\cancel{27}}}{\underset{4}{\cancel{12}}}$

$= \frac{9}{4}$

Think about how to calculate $1\frac{2}{3} + \frac{5}{8} - 1\frac{1}{6}$

$1\frac{2}{3} + \frac{5}{8} - 1\frac{1}{6} = \frac{5}{3} + \frac{5}{8} - \frac{7}{6}$

$= \frac{40}{24} + \frac{15}{24} - \frac{28}{24}$

$= \frac{\overset{9}{27}}{\underset{8}{24}}$

$= \frac{9}{8}$

Mixed fraction → Improper fraction
Change into the common denominator
Reduce it to the lowest term

Calculate:

(1) $\frac{1}{3} + 1\frac{2}{9} + \frac{1}{6}$ (2) $2\frac{1}{2} - \frac{1}{6} - \frac{1}{9}$ (3) $1\frac{7}{8} - \frac{3}{8} + \frac{1}{10}$

Exercise 6 (a)

1. Convert into improper fractions:

(1) $2\frac{2}{3}$ (2) $3\frac{1}{9}$ (3) $5\frac{5}{11}$ (4) $6\frac{3}{10}$ (5) $20\frac{1}{2}$

2. Convert into mixed fractions or integers.

(1) $\frac{7}{3}$ (2) $\frac{21}{5}$ (3) $\frac{36}{9}$ (4) $\frac{78}{11}$ (5) $\frac{220}{10}$

3. Calculate:

(1) $\frac{4}{6}+\frac{3}{6}$ (2) $1\frac{2}{3}+2\frac{2}{3}$ (3) $\frac{5}{6}+\frac{3}{6}$ (4) $\frac{3}{2}+\frac{1}{4}$ (5) $\frac{1}{3}+\frac{4}{5}$

(6) $1\frac{1}{3}+\frac{1}{6}$ (7) $\frac{4}{15}+1\frac{1}{12}$ (8) $1\frac{7}{15}+\frac{3}{5}$ (9) $\frac{8}{7}$ [illegible] $\frac{5}{7}$ (10) $1\frac{2}{5}$ [illegible] $\frac{4}{5}$

(11) $3-\frac{3}{4}$ (12) $\frac{7}{6}-\frac{1}{4}$ (13) $2\frac{2}{3}-\frac{4}{5}$ (14) $2\frac{1}{3}-\frac{8}{15}$ (15) $3\frac{7}{12}-1\frac{5}{6}$

4. Calculate:

(1) $\frac{1}{7}+\frac{3}{7}+\frac{5}{7}$ (2) $\frac{1}{18}+\frac{2}{9}+\frac{5}{6}$ (3) $2\frac{2}{3}+1\frac{1}{4}+1\frac{5}{6}$

(4) $\frac{20}{11}-\frac{7}{11}-\frac{8}{11}$ (5) $\frac{5}{2}$ [illegible] $\frac{1}{3}$ [illegible] $\frac{5}{6}$ (6) $5\frac{1}{15}-1\frac{3}{5}-2\frac{2}{3}$

(7) $\frac{7}{13}$ [illegible] $\frac{6}{13}+\frac{5}{13}$ (8) $\frac{3}{4}+\frac{7}{8}$ [illegible] $\frac{11}{12}$ (9) $1\frac{1}{3}+3\frac{1}{4}-2\frac{5}{6}$ [illegible] $\frac{3}{4}$

5. There are two strings of $3\frac{3}{4}$ m and $2\frac{1}{3}$ m. How many meters of strings are there altogether.

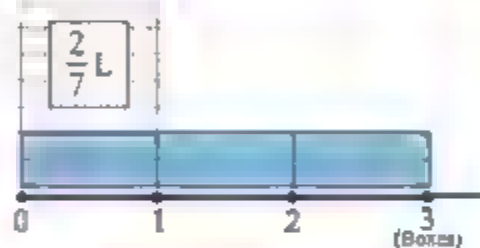
6 Gita has $1\frac{5}{6}$ L of juice and Mamun has $\frac{13}{8}$ L of juice. Who has more juice and how much more?

6.3.Multiplication by Integers

We need $\frac{2}{7}$ Litre of milk to make one box icecream. If we make 3 boxes, how many litres of milk do we need?

We can use this sentence to find the total amount.

Milk needed for 1 box icecream	×	Number of icecream box	=	Total milk needed

Mathematical sentence:

$\frac{2}{7}$ → 2 units of $\frac{1}{7}$

$\frac{2}{7} \times 3$ → (2×3) units of $\frac{1}{7}$

$\frac{2}{7} \times 3 =$ ☐

Let us calculate: $\frac{2}{7} \times 3 = \frac{2 \times 3}{7} = \frac{6}{7}$

☐ Litres

When we multiply a fraction by an integer, we keep the denominator same and multiply the numerator by the integer.

$\frac{●}{■} \times ▲ = \frac{● \times ▲}{■}$

1 Calculate.

(1) $\frac{4}{9} \times 2$ (2) $\frac{2}{5} \times 2$ (3) $\frac{3}{10} \times 3$ (4) $\frac{3}{5} \times 2$

(5) $\frac{2}{9} \times 5$ (6) $\frac{3}{8} \times 3$ (7) $\frac{4}{7} \times 3$ (8) $\frac{4}{5} \times 4$

Think about how to calculate $\frac{5}{12} \times 6$.

Compare and explain the multiplication below.

$$\frac{5}{12} \times 6 = \frac{5 \times 6}{12} = \frac{\overset{5}{\cancel{30}}}{\underset{2}{\cancel{12}}} = \frac{5}{2}$$

$$\frac{5}{12} \times 6 = \frac{5 \times \overset{1}{\cancel{6}}}{\underset{2}{\cancel{12}}} = \frac{5}{2}$$

It would be easy if we reduce the fraction during the calculation.

2 Calculate:

(1) $\frac{1}{4} \times 2$ (2) $\frac{3}{8} \times 4$ (3) $\frac{5}{6} \times 3$ (4) $\frac{5}{8} \times 6$

(5) $\frac{4}{9} \times 6$ (6) $\frac{7}{10} \times 8$ (7) $\frac{3}{5} \times 15$ (8) $\frac{2}{23} \times 46$

3 **1 dl of paint covers $\frac{3}{4}$ m² of a board. How many m² can be painted with 4 dl?**

4 **$\frac{2}{7}$ Kilogram of sugar is needed to make one pot payesh. How many kilograms of sugar is needed to make 14 pot payesh?**

2025

6.4. Division by Integers

$\frac{4}{5}$ **Litre of juice is distributed equally to 2 persons. How many litres of juice does each person get?**

Total amount of juice	÷	Number of people	=	Amount of juice for 1 person

Mathematical sentence:

$\frac{4}{5} \div 2 = \square$

$\frac{4}{5}$ → 4 units of $\frac{1}{5}$

$\frac{4}{5} \div 2$ → $(4 \div 2)$ units of $\frac{1}{5}$

Let us calculate. $\frac{4}{5} \div 2 = \frac{4 \div 2}{5} = \frac{2}{5}$

One person's juice _______ Litres

If distributed equally to three people, how do you calculate?

Mathematical sentence: $\frac{4}{5} \div 3$

It is $\frac{4 \div 3}{5}$, but 4 isn't divisible by 3.

We can change the numerator to divide by 3.

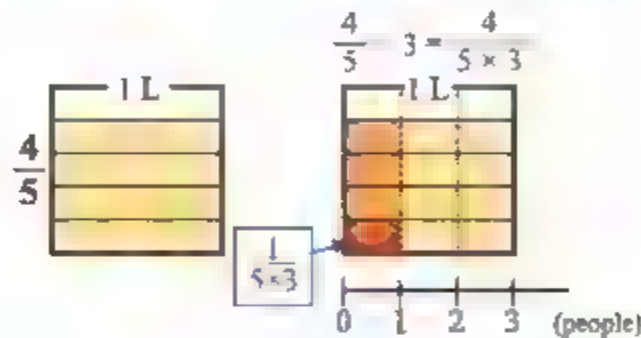
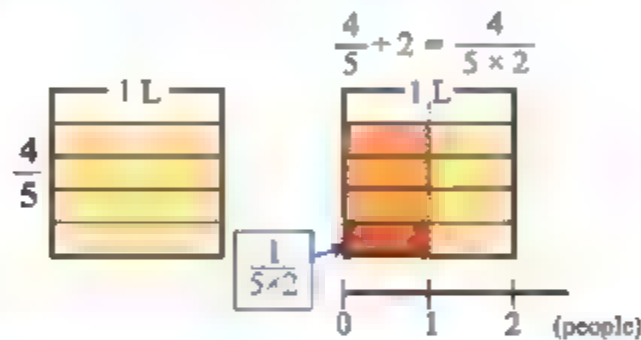
$\frac{4}{5} = \frac{4 \times 3}{5 \times 3}$

$$\frac{4}{5} \div 3 = \frac{4 \times 3}{5 \times 3} \div 3 = \frac{4 \times 3 \div 3}{5 \times 3} = \frac{4}{5 \times 3} = \frac{4}{15}$$

Let us calculate:

$\frac{4}{5} \div 3 = \frac{4}{5 \times 3} = \frac{4}{15}$

2025

Let's think about the reason why $\frac{4}{5} \div 3 = \frac{4}{5 \times 3}$.

Let's check that we can calculate $\frac{4}{5} \div 2 = \frac{4}{5 \times 2}$ as well.

When we divide a fraction by an integer, we keep the numerator and multiply the denominator by the integer.

$$\frac{●}{■} \div ▲ = \frac{●}{■ \times ▲}$$

Calculate:

(1) $\frac{1}{2} \div 3$ (2) $\frac{1}{3} \div 2$ (3) $\frac{1}{5} \div 3$ (4) $\frac{2}{5} \div 3$

(5) $\frac{3}{4} \div 2$ (6) $\frac{5}{6} \div 3$ (7) $\frac{4}{7} \div 3$ (8) $\frac{4}{9} \div 5$

Let us calculate: $\frac{10}{9} \div 8$

$$\frac{10}{9} \div 8 = \frac{10}{9 \times 8} = \frac{\overset{5}{\cancel{10}}}{\underset{36}{\cancel{72}}} = \frac{5}{36}$$

$$\frac{10}{9} \div 8 = \frac{\overset{5}{\cancel{10}}}{9 \times \underset{4}{\cancel{8}}} = \frac{5}{36}$$

It would be easy if we reduce the fraction during the calculation.

Calculate:

(1) $\frac{2}{3} \div 4$ (2) $\frac{3}{7} \div 6$ (3) $\frac{4}{5} \div 8$ (4) $\frac{5}{6} \div 10$

(5) $\frac{4}{3} \div 6$ (6) $\frac{8}{7} \div 6$ (7) $\frac{8}{5} \div 4$ (8) $\frac{12}{7} \div 4$

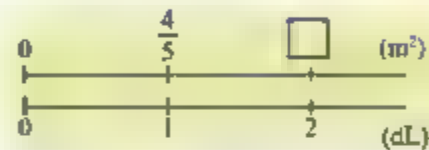
If $\frac{8}{9}$ Litre of milk is distributed equally to 5 people, how many litres of milk does each person get?

2 dl of paint covers $\frac{3}{5}$ m^2. How many m^2 can you paint with 1 dl ?

6.5. Multiplication by Fraction

Let us think about a paint of which 1 dl covers $\frac{4}{5}$ m^2.

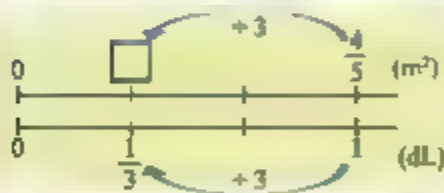
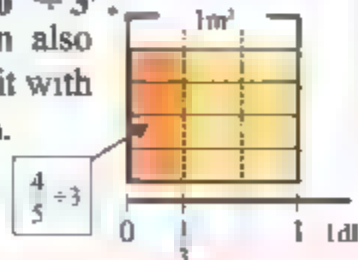
(1) How many m^2 can you paint with 2 dl?

Mathematical sentence:

Area covered by 1 dl	×	Amount of paint	=	Total area covered
$\frac{4}{5}$	×	2	=	$\frac{8}{5}$

_____ m^2

(2) Then how many m^2 can you paint with $\frac{1}{3}$ dl?

Area covered by 1 dl	×	Amount of paint	=	Total area covered
$\frac{4}{5}$	×	$\frac{1}{3}$		

How will we calculate it?

As the set of number lines shows, **it is equal to '÷ 3'.**
And we can also think about it with this diagram.

We calculate $\frac{4}{5} \times \frac{1}{3}$ as follows:

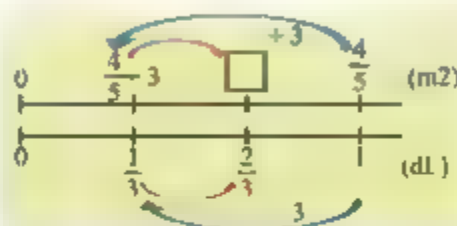
$$\frac{4}{5} \times \frac{1}{3} = \frac{4}{5} \div 3$$

$$= \frac{4}{5 \times 3} = \frac{4}{15}$$

_____ m^2

2025

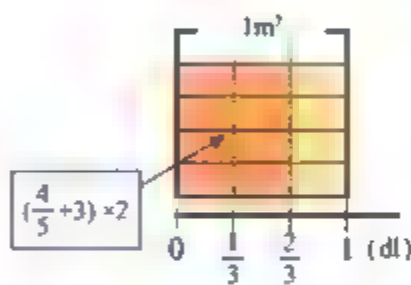
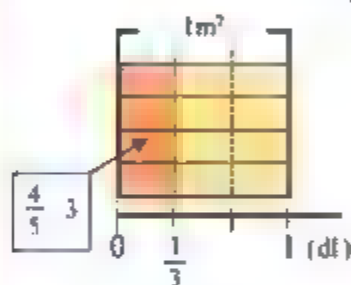
(3) Then how many m^2 can you paint with $\frac{2}{3}$ dl?

Mathematical sentence:

$\frac{4}{5} \times \frac{2}{3}$

The area covered with $\frac{2}{3}$ dl is twice of the area covered with $\frac{1}{3}$ dl.

1m²

$(\frac{4}{5} \div 3) \times 2$

0 $\frac{1}{3}$ $\frac{2}{3}$ 1 (dl)

$$\frac{4}{5} \times \frac{2}{3} = (\frac{4}{5} \div 3) \times 2$$

$$= \frac{4}{5 \times 3} \times 2$$

$$= \frac{4 \times 2}{5 \times 3}$$

$$= \frac{8}{15}$$

Let us calculate $\frac{4}{5} \times \frac{2}{3}$ as follows:

$$\frac{4}{5} \times \frac{2}{3} = \frac{4 \times 2}{5 \times 3} = \frac{8}{15}$$

When we multiply with fractions, multiply the numerators by numerators and denominators by denominators.

2025

Calculate:

(1) $\frac{2}{3}\times\frac{4}{5}$ (2) $\frac{3}{4}\times\frac{5}{7}$ (3) $\frac{5}{6}\times\frac{5}{3}$ (4) $\frac{9}{8}\times\frac{3}{5}$

(5) $\frac{3}{2}\times\frac{9}{5}$ (6) $\frac{4}{9}\times\frac{2}{3}$ (7) $\frac{7}{4}\times\frac{3}{5}$ (8) $\frac{9}{8}\times\frac{3}{5}$

Think about how to calculate $\frac{2}{7}\times 3$ and $2\times\frac{4}{5}$.

We can calculate by converting the integers into fractions with a denominator of 1.

$$\frac{2}{7}\times 3=\frac{2}{7}\times\frac{3}{1}=\frac{2\times 3}{7\times 1}=\frac{6}{7}$$

$$2\times\frac{4}{5}=\frac{2}{1}\times\frac{4}{5}=\frac{2\times 4}{1\times 5}=\frac{8}{5}$$

Of course this is also OK: $\frac{2}{7}\times 3=\frac{2\times 3}{7}=\frac{6}{7}$

Think about how to calculate $1\frac{1}{2}\times 1\frac{2}{5}$.

We can calculate by converting the mixed fractions into improper fractions

$$1\frac{1}{2}\times 1\frac{2}{5}=\frac{\square}{2}\times\frac{\square}{5}=\frac{21}{10}\ \left(\text{or } 2\frac{1}{10}\right)$$

Calculate:

(1) $4\times\frac{2}{3}$ (2) $2\times\frac{5}{11}$ (3) $\frac{5}{6}\times 7$ (4) $7\times\frac{4}{9}$

(5) $1\frac{1}{2}\times\frac{3}{5}$ (6) $1\frac{1}{3}\times 2\frac{2}{3}$ (7) $2\frac{3}{4}\times 1\frac{1}{6}$ (8) $2\frac{2}{3}\times 1\frac{3}{7}$

2025

Compare and explain how to calculate $\frac{8}{9} \times \frac{3}{4}$.

$$\frac{8}{9} \times \frac{3}{4} = \frac{8 \times 3}{9 \times 4} = \frac{\overset{2}{\cancel{24}}}{\underset{3}{\cancel{36}}} = \frac{2}{3}$$

$$\frac{8}{9} \times \frac{3}{4} = \frac{\overset{2}{\cancel{8}} \times \overset{1}{\cancel{3}}}{\underset{3}{\cancel{9}} \times \underset{1}{\cancel{4}}} = \frac{2}{3}$$

Moreover:

$$\frac{3}{4} \times \frac{10}{6} \times \frac{2}{5} = \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{\overset{2}{\cancel{10}}}}}{\underset{1}{\cancel{\underset{2}{\cancel{6}}}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{5}}} = \frac{1}{2}$$

Wow, although this is a problem of multiplication, we don't do any multiplication, just reduce the fraction!

3 Calculate:

(1) $\frac{1}{3} \times \frac{3}{5}$ (2) $\frac{3}{5} \times \frac{5}{7}$ (3) $\frac{4}{5} \times \frac{1}{8}$ (4) $\frac{3}{10} \times \frac{5}{7}$

(5) $\frac{5}{9} \times \frac{3}{11}$ (6) $\frac{7}{9} \times \frac{4}{21}$ (7) $\frac{5}{12} \times \frac{5}{10}$ (8) $\frac{9}{8} \times \frac{7}{15}$

(9) $\frac{3}{8} \times \frac{4}{3}$ (10) $\frac{7}{15} \times \frac{5}{7}$ (11) $\frac{3}{8} \times \frac{8}{9}$ (12) $\frac{5}{12} \times \frac{9}{10}$

(13) $\frac{5}{6} \times \frac{12}{25}$ (14) $\frac{3}{2} \times \frac{8}{15}$ (15) $\frac{7}{13} \times \frac{13}{7}$ (16) $\frac{20}{26} \times \frac{52}{10}$

(17) $\frac{2}{3} \times \frac{1}{5} \times \frac{3}{4}$ (18) $\frac{7}{12} \times \frac{1}{3} \times \frac{3}{14}$ (19) $\frac{7}{15} \times \frac{5}{6} \times \frac{3}{14}$ (20) $\frac{2}{21} \times \frac{45}{3} \times \frac{7}{15}$

2025

Find the fraction which can have a product of 1 when you multiply these fractions.

$\boxed{\frac{2}{3}}$ $\boxed{\frac{5}{7}}$

$$\frac{2}{3} \times \frac{3}{2} = 1 \qquad \frac{5}{7} \times \frac{7}{5} = 1$$

A number (or a fraction) is called the **reciprocal** of another number if the product of the two numbers is 1.

The reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$, and the reciprocal of $\frac{3}{2}$ is $\frac{2}{3}$.

The reciprocal of $\frac{5}{7}$ is $\frac{7}{5}$, and the reciprocal of $\frac{7}{5}$ is $\frac{5}{7}$.

The reciprocal of a fraction is the fraction with its numerator and denominator flipped.

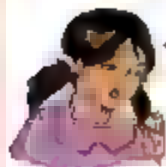
Write the reciprocal:

(1) $\frac{5}{7}$ (2) $\frac{4}{9}$ (3) $\frac{1}{3}$ (4) $\frac{1}{8}$

Write the reciprocal:

(1) 3 (2) 8 (3) 5 (4) 11

2025

Find the area of a rectangular piece of board with $\frac{4}{5}$ m long and $\frac{2}{3}$ m width.

Remember the formula for the area:
Area of a rectangle = length × width

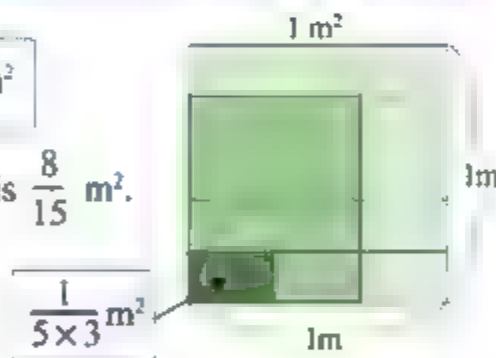
Mathematical sentence:

$\frac{4}{5} \times \frac{2}{3} = \square$

_____ m^2

Let's check the fact that the area is $\frac{8}{15}$ m^2 with the diagram below.

There are (4×2) $\frac{1}{5 \times 3} m^2$

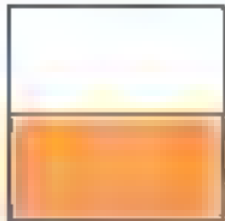
So it is $\frac{4 \times 2}{5 \times 3}$ ∴ Area is $\frac{8}{15}$ m^2.

We can use the formulas for area even if the length and widths are fractions.

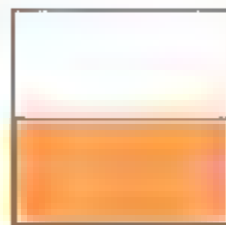
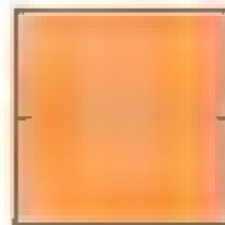
Find the area of a rectangular piece of board with $1\frac{3}{4}$ m long and $1\frac{1}{5}$ m width.

Find the area of a square piece of land with $2\frac{1}{2}$ km sides.

2025

'of' in mathematics

In our country 'of' is sometimes used as a kind of symbols as follows.

The yellow part is $\frac{1}{2}$ of 1.

And...

$$\left(\frac{1}{2} \text{ of } 1\right) + \left(\frac{1}{2} \text{ of } 1\right) = (1+1) \text{ of } \frac{1}{2}$$

$$= 2 \text{ of } \frac{1}{2}$$

$$= 1$$

In this case 'of' is the same meaning of '×', and calculation with 'of' should be done before any other operations (×, ÷, +, −).

Example:

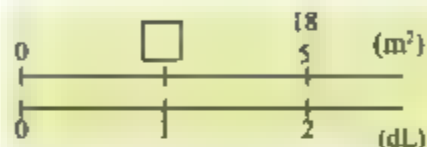
(1) $6 \div 3 \times 2 \text{ of } 4 = 16$

(2) $8 + \frac{1}{3} \text{ of } 6 \times 5 = 18$

2025

6.6. Division by Fraction

Think about painting a wall.

(1) 2 dl of paint covers a $\frac{18}{5}$ m² wall. How many m² can we paint with 1dl ?

We can use this sentence to find the area the 1 dL of paint covers.

Total area covered	÷	Amount of paint	=	Area covered by 1 dL

Mathematical sentence:

$$\frac{18}{5} \div 2 = \square$$

____ m²

(2) $\frac{1}{3}$ dL of paint covers a $\frac{3}{5}$ m² wall. How many m² can you paint with 1dL?

Total area covered	÷	Amount of paint	=	Area covered by 1 dL

Mathematical sentence:

$$\frac{3}{5} \div \frac{1}{3} = \square$$

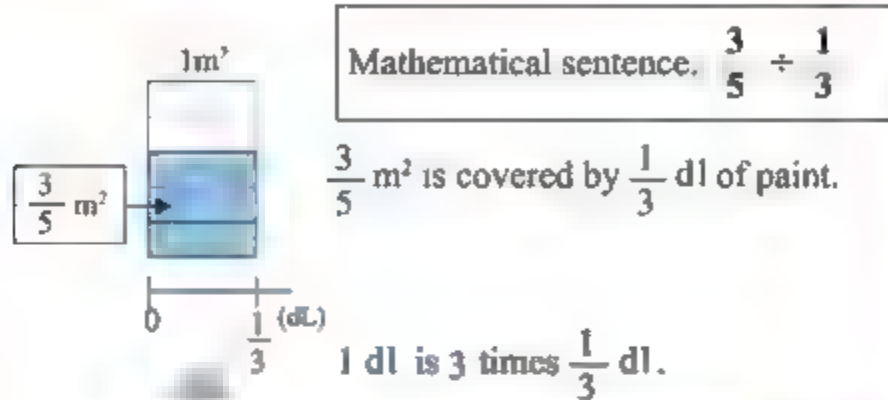
2025

Now let's think about how to calculate $\frac{3}{5} \div \frac{1}{3}$ with the diagram.

We will find the area which can be covered by 1 dl.

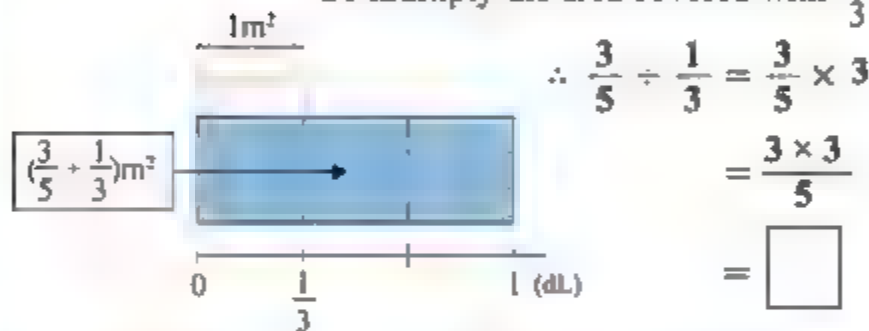
Mathematical sentence. $\frac{3}{5} \div \frac{1}{3}$

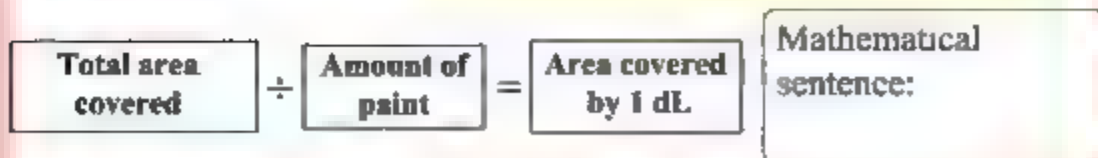
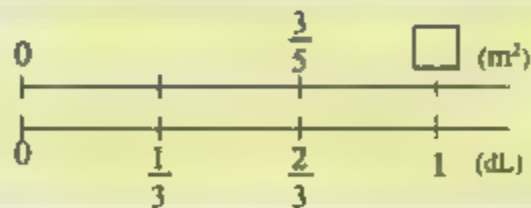
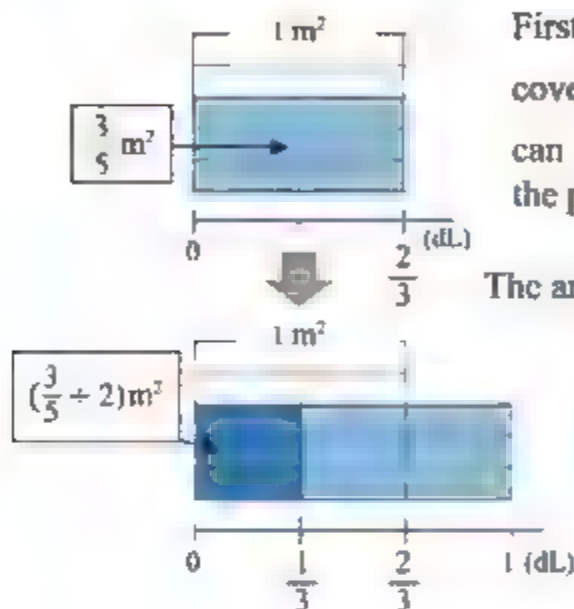
$\frac{3}{5}$ m² is covered by $\frac{1}{3}$ dl of paint.

1 dl is 3 times $\frac{1}{3}$ dl.

So multiply the area covered with $\frac{1}{3}$ dl by 3.

$$\therefore \frac{3}{5} \div \frac{1}{3} = \frac{3}{5} \times 3$$

$$= \frac{3 \times 3}{5}$$

$$= \square$$

(3) $\frac{2}{3}$ dl of paint covers $\frac{3}{5}$ m² wall. How many area can you paint with 1dl?

Mathematical sentence:

Let's think about how to calculate $\frac{3}{5} \div \frac{2}{3}$ with the diagram.

Firstly let's find the area which is covered by $\frac{1}{3}$ dL of paint. Then we can solve it with the same way as the previous problem.

The area covered by $\frac{1}{3}$ dL of paint is

$(\frac{3}{5} \div 2)$ m²

$\therefore \frac{3}{5} \div \frac{2}{3} = (\frac{3}{5} \div 2) \times 3$

$= \frac{3}{5 \times 2} \times 3 = \frac{3 \times 3}{5 \times 2} = \square$

_____ m²

When we divide fractions, multiply the first fraction by the reciprocal of the divisor.

1 Calculate:

(1) $\frac{3}{4} \div \frac{2}{7}$ (2) $\frac{1}{7} \div \frac{2}{5}$ (3) $\frac{4}{9} \div \frac{1}{4}$ (4) $\frac{3}{5} \div \frac{2}{9}$

(5) $\frac{3}{2} \div \frac{1}{3}$ (6) $\frac{2}{9} \div \frac{4}{9}$ (7) $\frac{8}{5} \div \frac{1}{2}$ (8) $\frac{9}{5} \div \frac{5}{6}$

(9) $\frac{1}{2} \div \frac{3}{4}$ (10) $\frac{2}{3} \div \frac{5}{6}$ (11) $\frac{6}{7} \div \frac{4}{9}$ (12) $\frac{7}{9} \div \frac{2}{27}$

(13) $\frac{2}{3} \div \frac{9}{8}$ (14) $\frac{2}{5} \div \frac{8}{15}$ (15) $\frac{2}{3} \div \frac{4}{9}$ (16) $\frac{7}{10} \div \frac{7}{12}$

2025

Think about how to calculate $\frac{7}{8} \div 4$ and $5 \div \frac{2}{3}$.

$\frac{7}{8} \div 4 = \frac{7}{8} \div \frac{4}{1}$

$= \frac{\square}{\square} \times \frac{\square}{\square}$

$= \frac{\square}{\square}$

$5 \div \frac{2}{3} = \frac{5}{1} \div \frac{2}{3}$

$= \frac{\square}{\square} \times \frac{\square}{\square}$

$= \frac{\square}{\square}$

Think about how to calculate $2\frac{1}{2} \div 2\frac{5}{6}$.

$2\frac{1}{2} \div 2\frac{5}{6} = \frac{\square}{\square} \div \frac{\square}{\square}$

$= \frac{\square}{\square} \times \frac{\square}{\square} = \frac{\square}{\square}$

Calculate:

(1) $7 \div \frac{5}{9}$ (2) $5 \div \frac{4}{7}$ (3) $3 \div \frac{6}{11}$ (4) $10 \div \frac{15}{2}$

(5) $1\frac{5}{8} \div 2\frac{1}{3}$ (6) $2\frac{1}{2} \div 2\frac{5}{6}$ (7) $3\frac{2}{3} \div 1\frac{1}{6}$ (8) $11 \div 2\frac{1}{4}$

Think about how to calculate $\frac{3}{4} \div \frac{6}{5} \times \frac{1}{5}$

$$\frac{3}{4} \div \frac{6}{5} \times \frac{1}{5} = \frac{3}{4} \times \frac{\square}{\square} \times \frac{1}{5} = \frac{\overset{1}{\cancel{3}} \times \overset{1}{\cancel{5}} \times 1}{4 \times \underset{2}{\cancel{6}} \times \underset{1}{\cancel{5}}} = \frac{\square}{\square}$$

When a calculation includes both multiplication and division, we can **convert the division into multiplication** and solve it.

Calculate:

(1) $\frac{2}{3}\times\frac{1}{8}\div\frac{7}{9}$ (2) $\frac{3}{8}\div\frac{3}{5}\times\frac{4}{5}$

(3) $\frac{3}{7}\times 4\div\frac{3}{5}$ (4) $\frac{2}{9}\div\frac{4}{7}\div\frac{5}{6}$

Mr. Habib kept $\frac{1}{4}$ portion of his property for himself and divided the rest of the property equally between his two children.

(1) What portion was the rest of the property after Mr. Habib kept his property for himself?

$1-\frac{1}{4}=\frac{\square}{\square}-\frac{1}{4}=\frac{\square}{\square}$ **__ portion**

(2) What portion of the property did each child get? Express in mathematical sentence and solve it.

$(1-\frac{1}{4})\div\square=\frac{3}{4}\div\square=\frac{3}{4\times2}=\frac{\square}{\square}$ **__ portion**

(3) If Mr. Habib has property of taka 200000, how much will each child get?

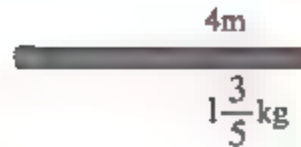
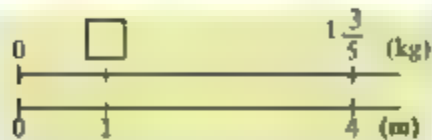
$\frac{1}{6}$ portion of a pole is in mud, $\frac{1}{2}$ portion is in water and the remaining portion is above water. The length of the portion above water is 2 m. What is the length of the pole in water?

2025

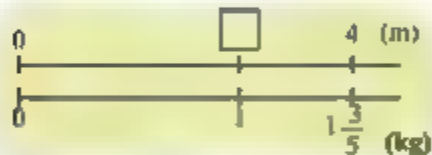
6.7. Division and Number Line

A metal pipe of 4 m weighs $1\frac{3}{5}$ kg.

4m

$1\frac{3}{5}$kg

(1) How many kg does 1 m of the pipe weighs?

Mathematical sentence:

weight ___ kg

(2) How long do you cut off if you need 1 kg of the pipe?

Mathematical sentence:

cut off ___ m

When we find 'amount for 1', we use division.
(1) Amount for '1 m'
(2) Amount for '1kg'

(3) A metal pipe of $\frac{5}{2}$ m weighs 1kg. How many kg is the weight of 4 m pipe?

$\frac{5}{2} \times \square = 4$

Mathematical sentence: $4 \div \frac{5}{2}$

weight ___ kg

We use division to find 'proportion against 1',
In (3), proportion of weight of 4 m against 1 kg

2025

Exercise 6 (b)

1. Calculate:

(1) $\frac{2}{3} \times 4$ (2) $\frac{3}{5} \times 3$ (3) $\frac{5}{6} \times 3$ (4) $\frac{1}{6} \times 9$

(5) $\frac{5}{7} \times \frac{2}{7}$ (6) $\frac{3}{4} \times \frac{3}{8}$ (7) $\frac{5}{6} \times \frac{3}{7}$ (8) $\frac{3}{8} \times \frac{7}{9}$

(9) $\frac{5}{8} \times \frac{4}{5}$ (10) $\frac{27}{12} \times \frac{8}{9}$ (11) $\frac{21}{25} \times \frac{15}{14}$ (12) $\frac{15}{64} \times \frac{40}{21}$

(13) $2 \times \frac{3}{7}$ (14) $10 \times \frac{4}{5}$ (15) $3\frac{1}{4} \times \frac{2}{13}$ (16) $10 \times 2\frac{4}{5}$

2. In a hostel every day $2\frac{1}{7}$ quintal of rice is needed. In that hostel how many quintals of rice is needed in one week?

3. 1m of metal pipe weighs $3\frac{1}{4}$ kg. How many kg does $\frac{3}{5}$ m of the pipe weigh?

4. 1 dl of paint covers $\frac{8}{9}$ m^2. How many m^2 can you paint with $\frac{5}{8}$ dl?

5. Calculate:

(1) $\frac{6}{7} \div 2$ (2) $\frac{3}{5} \div 3$ (3) $\frac{5}{8} \div 4$ (4) $\frac{9}{8} \div 6$

(5) $\frac{3}{5} \div \frac{2}{7}$ (6) $\frac{2}{9} \div \frac{9}{4}$ (7) $\frac{2}{3} \div \frac{5}{6}$ (8) $\frac{2}{5} \div \frac{8}{9}$

(9) $\frac{2}{3} \div \frac{8}{9}$ (10) $\frac{2}{5} \div \frac{8}{15}$ (11) $\frac{2}{3} \div \frac{4}{9}$ (12) $\frac{5}{7} \div \frac{15}{28}$

(13) $7 \div \frac{5}{9}$ (14) $8 \div \frac{6}{7}$ (15) $2\frac{1}{4} \div 2\frac{1}{4}$ (16) $11 \div 2\frac{1}{4}$

6. If you cut $6\frac{2}{5}$ m of string into $\frac{4}{5}$ m sections, how many pieces it will be?
7. A wall of $\frac{9}{7}$ m² can be covered by $\frac{3}{4}$ dL of paint. How many m² can you paint with 1dl ?
8. A metal pipe of 5 m weighs $2\frac{6}{7}$ kg. How long do you cut off if you need 1 kg of the pipe?

9. Calculate:

(1) $\frac{7}{15} \times \frac{5}{6} \times \frac{3}{14}$ (2) $\frac{7}{12} \div 2\frac{1}{3} \times \frac{2}{5}$ (3) $\frac{7}{12} \times \frac{2}{5} \div 2\frac{1}{3}$

10 Solve the problem:

(1) Flowers are planted in $\frac{5}{6}$ of a flower bed that has an area of 20 m². What is the area of planted flowers in m²?

(2) Ahmed has 4 kg of oil. 1L of the oil weighs $\frac{6}{7}$ kg. How many L oil does he have?

(3) Mr. Sajjad had 24000 taka He donated $\frac{5}{12}$ portion of his money to an orphanage, $\frac{3}{8}$ portion to an educational institution. What amount of money was he left with?

Chapter 7

Decimal Fractions

7.1. Decimal number

In a marathon, a long-distance road race, people run an official distance of 42.195 kilometres. Now we examine this number.

The number 42.195 is a decimal fraction that has tenths', hundredths' and thousandths' places as shown below.

Name of place	Tens' place	Ones' place	Tenths' place	Hundredths' place	Thousandths' place
Unit	10	1	0.1	0.01	0.001
Number	4	2 .	1	9	5

In 42.195, how many 10, 1, 0.1, 0.01, and 0.001?

In multiplying 1 by 10 and dividing 1 by 10, we have the following numbers.

100 ⇄ 10 ⇄ 1 ⇄ 0.1 ⇄ 0.01 ⇄ 0.001 (each leftward arrow: ×10)

(1) How many 0.1s make 2.1?

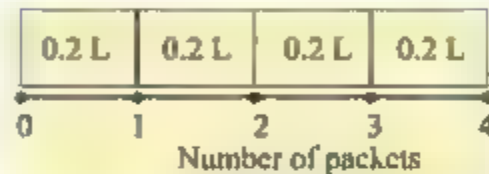
(2) How many 0.01s make 0.19?

(3) How many 0.001s make 0.195?

(4) How many 0.001s make 42.195?

7.2. Multiplication by Integers

There are 4 packets of milk, and each packet contains 0.2 litres of milk. How many litres of milk will there be if we put them together?

Mathematical sentence:

0.2 → 2 units of 0.1

0.2 × 4 → (2 × 4) units of 0.1

Milk : ________ Litres

Explain the multiplication (1) 0.3 × 7 and (2) 0.5 × 8

(1) 0.3 × 7

0.3 is ____ units of 0.1.

0.3 × 7 is (___ ×) units of 0.1

Thus, 0.3 × 7 = ______

(2) 0.5 × 8

0.5 is ____ units of 0.1.

0.5 × 8 is (___ ×) units of 0.1.

Thus, 0.5 × 8 = ______

1 **Multiply:**

(1) 0.3 × 2 (2) 0.6 × 9 (3) 0.5 × 4 (4) 0.8 × 5

2 **There are 5 cups and each cup weighs 0.3 kg. How many kilograms do these 5 cups weigh?**

2025

Explain the multiplication (1) 0.03 × 4 and (2) 0.05 × 6

(1) 0.03 × 4	(2) 0.05 × 6
0.03 is ____ units of 0.01	0.05 is ____ units of 0.01
0.03 × 4 is (___ × ___) units of 0.01.	0.05 × 6 is (___ × ___) units of 0.01.
Thus, 0.03 × 4 = ______.	Thus, 0.05 × 6 = ______.

Multiply:

(1) 0.02 × 3 (2) 0.04 × 3 (3) 0.05 × 2 (4) 0.08 × 5

Explain the multiplication 0.004 × 7

0.004 × 7

0.004 is _____ units of 0.001.

0.004 × 7 is (___ × ___) units of 0.001.

Thus, 0.004 × 7 = _________.

Multiply:

(1) 0.003 × 2 (2) 0.008 × 9 (3) 0.006 × 5

Answer the following questions:

(1) There are 7 packets of milk, and each packet contains 0.08 L of milk. How many liters of milk is there in total?

(2) A motorcycle runs 0.02 km per second. How many kilometers will it run in 8 seconds?

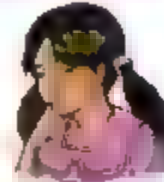
2025

Explain the multiplication 2.13 × 6

2.13 × 6

2.13 is ____ units of 0.01.

2.13 × 6 is (___ × ___) units of 0.01.

Thus, 2.13 × 6 = __________.

$$\begin{array}{r} 2.13 \\ \times \quad 6 \\ \hline 1278 \end{array}$$

$$\begin{array}{r} 2.13 \\ \times \quad 6 \\ \hline 12.78 \end{array}$$

Multiply numbers without thinking the decimal point	Put a decimal point at the same place in the multiplicand.

Multiply vertically:

(1) 3.4 × 7 (2) 6.7 × 8 (3) 7.6 × 4 (4) 8.5 × 9

(5) 1.23 × 4 (6) 3.52 × 9 (7) 4.18 × 3 (8) 5.26 × 4

(9) 0.212 × 3 (10) 4.037 × 8 (11) 3.215 × 8

Multiply: (1) 4.3 × 23 and (2) 2.4 × 35

(1)
$$\begin{array}{r} 4.3 \\ \times \ 23 \\ \hline 129 \\ 86 \\ \hline 98.9 \end{array}$$

(2)
$$\begin{array}{r} 2.4 \\ \times \ 35 \\ \hline 120 \\ 72 \\ \hline 84.0 \end{array}$$

Multiply vertically:

(1) 2.3 × 16 (2) 4.6 × 38 (3) 7.6 × 45

(4) 16.7 × 52 (5) 24.5 × 26 (6) 30.9 × 23

(7) 6.47 × 28 (8) 4.08 × 63 (9) 5.25 × 24

7.3. Multiplication by 10 and 100

Multiply: (1) 2.395 × 10 and (2) 2.395 × 100

(1)

```
   2.3 9 5
 ×     1 0
   0 0 0 0
 2 3 9 5
 2 3.9 5 0
```

(2)

```
      2.3 9 5
 ×      1 0 0
      0 0 0 0
    0 0 0 0
  2 3 9 5
  2 3 9.5 0 0
```

When multiplying by 10 and 100, the decimal point moves to the right as many as the number of 0s.

Discuss in the classroom how the place of a decimal point changes when multiplying 2.395 by 1000

Multiply by 10 and 100:

(1) 3.48 (2) 0.8 (3) 0.092

Which number will you multiply with 4209 to get the following numbers?

(1) 420.9 (2) 42.09

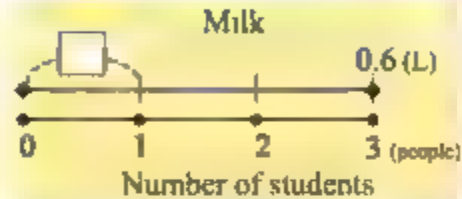
Multiply:

(1) 2.45 × 10 (2) 6.3 × 10 (3) 0.021 × 10

(4) 3.748 × 100 (5) 0.9 × 100 (6) 13.7 × 100

7.4. Division by Integers

We want to equally divide 0.6 L of milk among 3 students. How many litres of milk will each student have?

Mathematical sentence :

0.6 → 6 units of 0.1

0.6 ÷ 3 → (6 ÷ 3) units of 0.1

0.6 ÷ 3 = ☐

______ **Litres**

Explain the divisions (1) 0.8 ÷ 4 and (2) 1.5 ÷ 3

(1) 0.8 ÷ 4

0.8 is ____ units of 0.1.

0.8 ÷ 4 is

(____ ÷ ____) units of 0.1.

Thus, 0.8 ÷ 4 = ____ .

(2) 1.5 ÷ 3

1.5 is ____ units of 0.1.

1.5 ÷ 3 is

(____ ÷ ____) units of 0.1.

Thus, 1.5 ÷ 3 = ____ .

Divide:

(1) 0.9 ÷ 3 (2) 1.6 ÷ 8 (3) 4.2 ÷ 7 (4) 7.2 ÷ 9

5 students want to divide 4.5 metres of tape equally among them. How many metres of tape will each have?

2025

Explain the divisions (1) 0.16 ÷ 2 and (2) 0.36 ÷ 6

(1) 0.16 ÷ 2

0.16 is _____ units of 0.01.

0.16 ÷ 2 is

(_____ ÷ ___) units of 0.01.

Thus, 0.16 ÷ 2 = _______

(2) 0.36 ÷ 6

0.36 is _____ units of 0.01.

0.36 ÷ 6 is

(_____ ÷ ___) units of 0.01.

Thus, 0.36 ÷ 6 = _______

Divide:

(1) 0.09 ÷ 3 (2) 0.12 ÷ 4 (3) 0.24 ÷ 8 (4) 0.35 ÷ 5

(5) 0.18 ÷ 2 (6) 0.32 ÷ 4 (7) 0.28 ÷ 7 (8) 0.42 ÷ 6

Explain the divisions (1) 0.009 ÷ 3 and (2) 0.035 ÷ 7

(1) 0.009 ÷ 3

0.009 is _____ units of 0.001.

0.009 ÷ 3 is

(_____ ÷ ___) units of 0.001.

Thus, 0.009 ÷ 3 = _______.

(2) 0.035 ÷ 7

0.035 is _____ units of 0.001.

0.035 ÷ 7 is

(_____ ÷ ___) units of 0.001.

Thus, 0.035 ÷ 7 _______.

Divide:

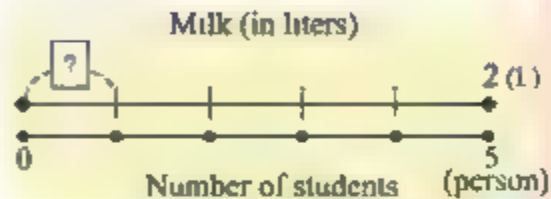
(1) 0.008 ÷ 2 (2) 0.016 ÷ 4 (3) 0.028 ÷ 7 (4) 0.042 ÷ 6

(5) 0.021 ÷ 3 (6) 0.018 ÷ 9 (7) 0.025 ÷ 5 (8) 0.048 ÷ 8

There is 0.63 liters of oil in a container. When we divide it equally into 7 cups, how many liters of oil will each cup contain?

2025

We want to equally divide 2 litres of milk among 5 students. How many litres of milk will each student have?

Mathematical sentence :

2 → 20 units of 0.1

2 ÷ 5 → (20 ÷ 5) units of 0.1

2 ÷ 5 = ☐

________ **Litres of milk**

Explain the divisions (1) 0.2 ÷ 5 and (2) 0.04 ÷ 8

(1) 0.2 ÷ 5

0.2 is _____ units of 0.01.

0.2 ÷ 5 is

(_____ ÷ ___) units of 0.01.

Thus, 0.2 ÷ 5 = _______

(2) 0.04 ÷ 8

0.04 is _____ units of 0.001.

0.04 ÷ 8 is

(_____ ÷ ___) units of 0.001.

Thus, 0.04 ÷ 8 =

0.2 = 0.20 → 20 units of 0.01

0.04 = 0.040 → 40 units of 0.001

6 **Divide:**

(1) 2 ÷ 4 (2) 3 ÷ 5 (3) 0.3 ÷ 5 (4) 0.4 ÷ 8

(5) 0.1 ÷ 2 (6) 0.03 ÷ 6 (7) 0.04 ÷ 5 (8) 0.02 ÷ 4

2025

Explain the division 7.2 ÷ 3

7.2 is _____ units of 0.1

7.2 ÷ 3 is (_____ ÷ ___) units of 0.1.

Thus, 7.2 ÷ 3 = _________.

We can do this division vertically as below.

$$3\overline{)7.2} \rightarrow 2 \quad \text{(first step: } 3 \cdot 2 = 6\text{)}$$

Step 1	Step 2	Step 3	Step 4
3)7.2, quotient 2, subtract 6	3)7.2, quotient 2, 7 − 6 = 1	3)7.2, quotient 2 . , bring down 2: 12	3)7.2, quotient 2.4, 12 − 12 = 0

Do the division as in integers.

Put a decimal point at the same place in the quotient as in the dividend.

Divide vertically.

(1) $2\overline{)4.2}$ (2) $3\overline{)8.1}$ (3) $6\overline{)8.4}$

(4) $5\overline{)37.5}$ (5) $6\overline{)39.6}$ (6) $6\overline{)30.6}$

Discuss how to divide 4.92 ÷ 6 vertically.

Write 0 at the ones place as we cannot divide 4 by 6.

Put a decimal point at the same place as in the dividend.

Step 1	Step 2	Step 3
6)4.92, quotient 0. , subtract 0	6)4.92, quotient 0.8; 0; 49 − 48 = 1	6)4.92, quotient 0.82; 0; 49 − 48 = 1; 12 − 12 = 0

Discuss how to divide 0.329 ÷ 7 vertically.

```
    0.              0.0             0.04            0.047
7)0.329         7)0.329         7)0.329         7)0.329
  0               0               0               0
                  --              --              --
                   3               3               3
                   0               0               0
                  --              --              --
                   3               32              32
                                   28              28
                                   --              --
                                    4               49
                                                    49
                                                    --
                                                     0
```

Arrange vertically so as not to make mistake in calculation!

Divide 5 ÷ 8 vertically.

```
   0.           0.6           0.62           0.625
8)5           8)5.0         8)5.00         8)5.000
  0             0             0              0
                --            --             --
                50            50             50
                48            48             48
                --            --             --
                 2             20             20
                               16             16
                               --             --
                                4              40
                                               40
                                               --
                                                0
```

Add 0 to continue division!

8 **Divide vertically:**

(1) 7)2.24 (2) 8)6.72 (3) 5)0.75

(4) 3)9.18 (5) 6)24.3 (6) 4)1

9 **Divide vertically:**

(1) 3)0.642 (2) 7)0.749 (3) 5)0.405

(4) 4)10.812 (5) 6)60.03 (6) 8)3

7.5. Division by 2-digit numbers

Discuss how to conduct the division 98.7 ÷ 21 vertically.

```
      4.              4.7
21)98.7          21)98.7
   84               84
                    147
                    147
                      0
```

Put a decimal point at the same place of quotient as in the dividend.

No matter how many digits there are, we can calculate it as in integers

Conduct the division 59.76 ÷ 48 vertically.

```
      1.             1.2              1.24              1.245
48)59.76        48)59.76         48)59.76         48)59.760
   48              48               48               48
   11              117              117              117
                    96               96               96
                    21              216              216
                                    192              192
                                     24              240
                                                     240
                                                       0
```

Add 0 to continue division!

Divide vertically:

(1) $23\overline{)59.8}$ (2) $38\overline{)64.6}$ (3) $12\overline{)4.8}$

(4) $43\overline{)9.46}$ (5) $36\overline{)2.88}$ (6) $24\overline{)2.16}$

Divide vertically:

(1) $12\overline{)16.2}$ (2) $25\overline{)32.1}$ (3) $25\overline{)26.5}$

(4) $72\overline{)1.8}$ (5) $32\overline{)24}$ (6) $16\overline{)10}$

2025

7.6. Division by 10 and 100

Calculate (1) 24.3 ÷ 10 and (2) 24.3 ÷ 100

(1)

```
       2.43
 10 ) 24.30
      20
      ----
       4 3
       4 0
      ----
         30
         30
      ----
          0
```

(2)

```
        0.243
 100 ) 24.300
       20 0
       -----
        4 30
        4 00
       -----
         300
         300
       -----
           0
```

When dividing by 10 and 100, the decimal point moves to the left as many as the number of 0s.

2 4 . 3

2 . 4 3 (÷ 10)

0 . 2 4 3 (÷ 10) (÷ 100)

Discuss in the classroom how the place of a decimal point changes when dividing 24.3 by 1000.

Divide them by 10 and 100:

(1) 2.8 (2) 4 (3) 20.3

Which number will you multiply with 36.4 to get the following numbers?

(1) 0.364 (2) 3.64

Divide:

(1) 2.45 ÷ 10 (2) 6.3 ÷ 10 (3) 9 ÷ 10

(4) 8.7 ÷ 100 (5) 0.3 ÷ 100 (6) 24 ÷ 100

Exercise 7 (a)

1. Answer the following questions :

   (1) How many 0.1s make 3.5 ?

   (2) How many 0.01s make 1.04 ?

   (3) How many 0.001s make 23.456 ?

2. Multiply:

   (1) 0.4×2 (2) 0.3×5 (3) 0.5×8 (4) 0.03×3

   (5) 0.09×4 (6) 0.06×5 (7) 0.007×8 (8) 0.004×5

3. Multiply:

   (1) 2.3×3 (2) 6.4×8 (3) 5.6×4 (4) 7.5×6

   (5) 3.12×2 (6) 4.53×4 (7) 6.07×9 (8) 4.08×5

   (9) 0.313×3 (10) 0.845×7 (11) 0.507×8 (12) 2.954×5

4. Multiply:

   (1) 3.6×14 (2) 6.7×58 (3) 4.2×25 (4) 3.8×45

   (5) 2.12×69 (6) 3.64×25 (7) 9.08×48 (8) 8.06×15

   (9) 0.26×23 (10) 2.85×36 (11) 4.07×58 (12) 2.08×75

5. Multiply:

   (1) 3.76×10 (2) 6.2×10 (3) 4.105×100 (4) 8.9×100

6. In a class of 75 students, teacher distributes 0.24 metres of tape to each student. How many metres of tape are distributed?

7. One basket of fruit weighs 2.565 kilograms. Find the weight of 12 baskets of this fruit.

8. A packet contains 0.334 litres of milk. How many litres of milk will there be if we have 50 packets?

9. Divide

(1) $0.8 \div 2$ (2) $1.5 \div 5$ (3) $4.8 \div 8$ (4) $0.09 \div 3$

(5) $0.28 \div 4$ (6) $0.45 \div 5$ (7) $0.056 \div 7$ (8) $0.072 \div 9$

10. Divide

(1) $3 \div 5$ (2) $2 \div 4$ (3) $0.2 \div 5$ (4) $0.2 \div 4$

(5) $0.3 \div 6$ (6) $0.02 \div 4$ (7) $0.03 \div 5$ (8) $0.04 \div 8$

11. Divide

(1) $8.5 \div 5$ (2) $9.8 \div 7$ (3) $2.34 \div 3$ (4) $4.38 \div 6$

(5) $2.316 \div 3$ (6) $4.218 \div 6$ (7) $40.065 \div 5$ (8) $52.184 \div 4$

12. Divide

(1) $2.6 \div 4$ (2) $3.2 \div 5$ (3) $0.4 \div 8$ (4) $51.52 \div 5$

(5) $60.03 \div 6$ (6) $35.04 \div 5$ (7) $8 \div 5$ (8) $1 \div 8$

13. Divide

(1) $32.2 \div 14$ (2) $46.4 \div 16$ (3) $156.4 \div 23$ (4) $84 \div 35$

(5) $3.12 \div 12$ (6) $55.08 \div 18$ (7) $148.4 \div 35$ (8) $54 \div 24$

14. Divide:

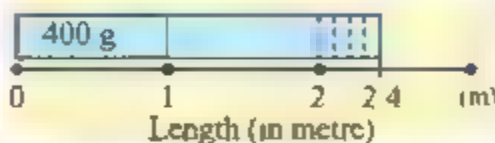
(1) $2.47 \div 10$ (2) $3 \div 10$ (3) $5.1 \div 100$ (4) $42 \div 100$

15. Villagers want to equally divide 35.28 litres of oil among 9 families. How many litres of oil will each family receive?

16. There are 12 cups of the same kind, which weigh 4.14 kilograms. How many kilograms does each cup weigh?

7.7. Multiplication by Decimals

There is a wire and its weight is 400 grams per metre. If it is 2.4 metres in length then what is the weight of the wire?

The length of the wire is one tenth of 24 meters of this wire

The length of the wire is equal to 24 units of 0.1 metres.

Mathematical sentence:

Meena's idea

The weight of 2.4 meters of wire is $\frac{1}{10}$ of 24 meters of wire.

Therefore, $400 \times 2.4 = (400 \times 24) \div 10 = 9600 \div 10 = 960$ g

weight of the wire: 960 grams

Reza's idea

2.4 metres are equal to 24 units of 0.1 metres.

The weight of 0.1 metre of wire is $\frac{1}{10}$ of 400 g → $400 \div 10 = 40$ g

Therefore, $400 \times 2.4 = (400 \div 10) \times 24 = 40 \times 24 = 960$ g

weight of the wire: 960 grams

1 **Use either the Meena's or Reza's idea above to calculate the weight of 0.8 metres of the above wire.**

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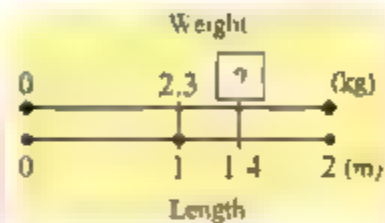
Multiply:

(1) 30×1.2 (2) 4×1.3 (3) 35×2.4

(4) 50×0.7 (5) 8×0.6 (6) 25×0.4

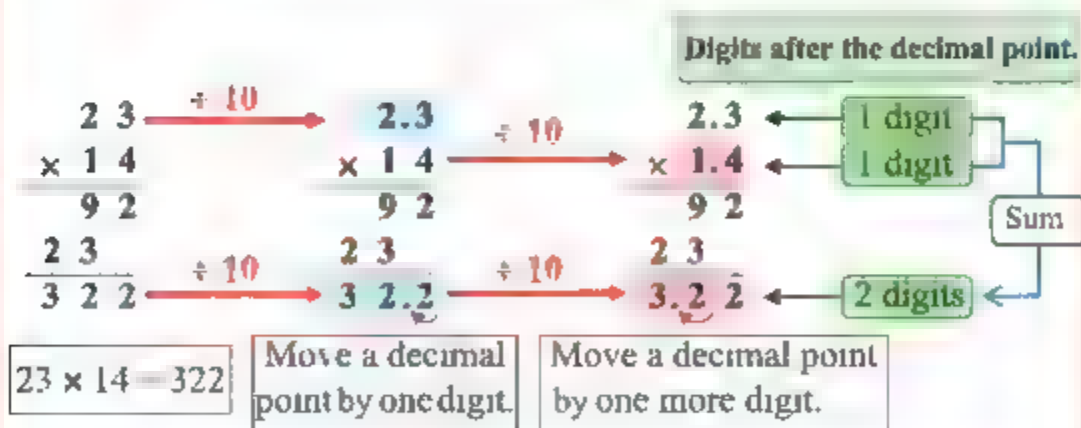
There is an iron bar, and its weight is 2.3 kg per metre. How many kilograms will it be if it is 1.4 metres in length?

Mathematical sentence:

(Weight per meter) × (Length) = (Weight for the whole)

[Solution]

The weight for 1.4 metres is $\frac{1}{10}$ of the weight for 14 metres.

Therefore, the weight is equal to: $2.3 \times 14 \div 10 =$ ______

We can calculate it in the following way.

Discuss how to calculate the following multiplications.

(1) 0.2 × 0.16 **(2) 2.8 × 1.75**

0.032
(It has 3 digits after the decimal point)

4.9
(It is unnecessary to write 0 after decimal point)

Discuss how to calculate the multiplication 16 × 3.14 .

Multiply vertically:

(1) 3.2 × 1.24 (2) 4.37 × 6.8 (3) 0.35 × 2.9

(4) 4.1 × 0.73 (5) 3.68 × 0.15 (6) 0.74 × 2.5

(7) 0.32 × 0.4 (8) 0.6 × 0.13 (9) 0.25 × 0.8

(10) 29 × 4.73 (11) 18 × 0.65 (12) 26 × 0.415

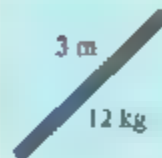
Explain what mistakes the following multiplications have made, and then correct them.

(1)
$$\begin{array}{r} 5.1 \\ \times\ 4.2 \\ \hline 1\,0\,2 \\ 2\,0\,4\ \ \\ \hline 2.1\,4\,2 \end{array}$$

(2)
$$\begin{array}{r} 0.2 \\ \times\ 0.17 \\ \hline 1\,4 \\ 2\ \ \\ \hline 0.3\,4 \end{array}$$

(3)
$$\begin{array}{r} 0.3 \\ \times\ 0.62 \\ \hline 6\,0 \\ 1\,8\ \ \\ \hline 0.2\,4\,0 \end{array}$$

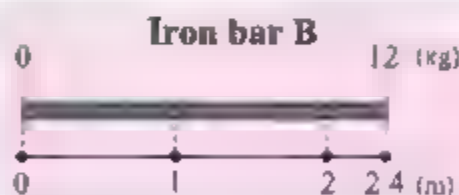
7.8. Division by Decimal Numbers

Iron bars A and B have the same weight of 12 kg but are different in length as shown on the right. Find the weight per metre of each iron bar.

(1) Weight per metre of iron bar A

We can find the weight per metre of iron bar A by division.

weight: 4 kg

(2) Weight per metre of iron bar B

As in iron bar A, we can find the weight per metre by (Weight) ÷ (Length)

Mathematical sentence:

Reza's idea

2.4 metres are equal to 24 units of 0.1 metres.

The weight of 0.1 metre of iron bar B is $\frac{1}{24}$ of 12 kg

→ 12 ÷ 24 = 0.5 (kg)

The weight of 1 metre iron bar B is 10 times more than that of 0.1 metre.

→ 0.5 × 10 = 5 (kg)

Therefore, 12 ÷ 2.4 = 5 (kg).

weight: 5 kilograms

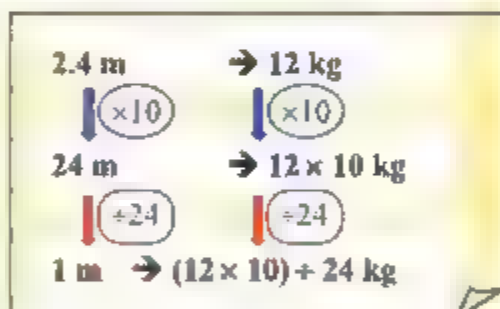
Meena's idea

The weight of 24 metres of iron bar B is 10 times more than that of 2.4 metres.

→ 12 × 10= 120 (kg)

Therefore, the weight of 1 metre iron bar is $\frac{1}{24}$ of 120 kg.

→120 ÷ 24 = 5 (kg)

Therefore, 12 ÷ 2.4 = 5 (kg).

weight: 5 kilograms

Fill in the blanks:

(1) 3 ÷ 1.5 = (3 ÷ 15) × ____ = ______

(2) 18 ÷ 1.2 = (18 ÷ 12) × ____ = ______

(3) 5 ÷ 0.25 = (5 ÷ 25) × ____ = ______

(4) 2 ÷ 0.125 = (2 ÷ 125) × ____ = ______

Iron bar C is 0.8 metre in length but its weight is 12 kilograms. Use either the Reza's or Meena's idea from the previous page to calculate the weight per metre of iron bar C.

Divide:

(1) $7 \div 1.4$ (2) $10 \div 2.5$ (3) $48 \div 1.2$

(4) $8 \div 0.4$ (5) $36 \div 0.6$ (6) $40 \div 0.2$

Do the following divisions. What can you find in the quotients?

(1) $2.4 \div 4$ (2) $24 \div 40$ (3) $1.2 \div 2$

[Solution]

(1) $2.4 \div 4 = 0.6$ (2) $24 \div 40 = 0.6$ (3) $1.2 \div 2 = 0.6$

These three divisions have the same quotient. There is the following relationship between these divisions.

Property of Division

In division, the quotient remains the same when multiplying both the dividend and the divisor by the same number.

Calculate the following divisions by using the fact that:

$5.16 \div 12 = 0.43$

(1) $51.6 \div 120$ (2) $0.516 \div 1.2$ (3) $10.32 \div 24$

There is 1.6 litres of paint in a pot and it weighs 2.4 kg. Find the weight per litre of this paint.

Mathematical sentence:

(Weight) ÷ (Volume)
(Weight per litre)

[Solution]

2.4 ÷ 1.6 = (2.4 × 10) ÷ (1.6 × ___)

= ___ ÷ ___

= ___

weight per litre ______ kg

Discuss how to calculate (1) 4.65 ÷ 1.5 and (2) 2.16 ÷ 0.24

(1)

1.5)4.65 → 1.5)4.6.5 (×10, ×10) → 15)46.5 = 3.1 (45, 15, 15, 0)

Convert the divisor 1.5 into an integer 15 by multiplying both the dividend and the divisor by 10

Put the decimal point at the same place as in the dividend

(2)

0.24)2.16 → 0.24)2.16 (×100, ×100) → 24)216 = 9 (216, 0)

Convert the divisor 0.24 into an integer 24 by multiplying both the dividend and the divisor by 100.

2025

Discuss how to calculate the division $2 \div 1.25$

Divide:

(1) $4.2 \div 0.6$ (2) $1.8 \div 0.9$ (3) $3.5 \div 0.7$

(4) $0.4 \div 0.5$ (5) $0.48 \div 0.6$ (6) $0.63 \div 0.9$

(7) $4.5 \div 0.05$ (8) $0.09 \div 0.03$ (9) $0.02 \div 0.05$

Divide vertically:

(1) $4.5 \div 1.5$ (2) $0.48 \div 1.2$ (3) $10.4 \div 2.6$

(4) $6.72 \div 3.2$ (5) $36.18 \div 5.4$ (6) $8.84 \div 2.6$

(7) $9.12 \div 0.06$ (8) $9.5 \div 0.38$ (9) $16 \div 0.25$

(10) $4 \div 0.125$ (11) $3 \div 0.006$ (12) $12 \div 0.096$

Explain what mistakes you find in the following divisions have and correct them.

(1) $4.65 \div 15$ (2) $21.32 \div 5.2$ (3) $3 \div 0.125$

```
       3 1                4 1                 0.0 2 4
15 ) 4.6 5       5.2 ) 2 1.3 2       0.125 ) 3
     4 5                2 0 8                 2 5 0
     ----               -----                 -----
       1 5                5 2                   5 0 0
       1 5                5 2                   5 0 0
     ----               -----                 -----
         0                  0                       0
```

There is a rectangular shaped land whose area is 29.4 m². When its length is 8.4 metres, find the width of this land.

Exercise 7 (b)

1. Multiply:

(1) 20×2.4 (2) 40×1.8 (3) 25×1.4 (4) 5×3.2

(5) 50×0.9 (6) 30×0.4 (7) 25×0.8 (8) 4×0.5

2. Multiply:

(1) 4.3×2.35 (2) 3.16×4.7 (3) 0.44×3.8

(4) 5.2×0.84 (5) 1.24×0.25 (6) 0.85×1.6

(7) 0.43×0.5 (8) 0.7×0.24 (9) 0.25×2.8

(10) 8×3.14 (11) 12×0.45 (12) 28×0.325

3. In the following multiplications which product will be smaller than the multiplicand?

(A) 3.2×3.2 (B) 0.97×0.97 (C) 1.01×1.01

4. One inch equals 2.54 centimetres. How many centimetres are equal to 8.5 inches?

5. A car travels 42.8 kilometres in one hour. How many kilometres will it travel in 15.5 hours?

6. A rectangular land has the width of 4.75 metres and the length of 12.8 metres. Find the area of this land.

7. Reza's weight is 36.5 kg. and his younger brother's and his father's weight is 0.8 times and 1.6 times of his weight, respectively. Find his brother's and his father's weight.

8. Fill in the blanks :

   (1) $2 \div 1.6 = (2 \div 16) \times$ ____ = ____

   (2) $3 \div 0.25 = (3 \div 25) \times$____ =____

   (3) $5 \div 0.125 = (5 \div 125) \times$ ____= ____

9. Divide:

   (1) $9 \div 1.8$ (2) $72 \div 1.2$ (3) $12 \div 0.4$ (4) $30 \div 0.5$

10. Divide:

   (1) $4.8 \div 0.6$ (2) $7.2 \div 0.9$ (3) $0.3 \div 0.5$

   (4) $0.49 \div 0.7$ (5) $5.6 \div 0.08$ (6) $0.03 \div 0.06$

11. Do the following divisions.

   (1) $11.18 \div 4.3$ (2) $25.35 \div 6.5$ (3) $22.8 \div 9.5$

   (4) $18.72 \div 0.08$ (5) $16.8 \div 0.35$ (6) $4.05 \div 0.018$

   (7) $2.94 \div 0.028$ (8) $5.1 \div 0.025$ (9) $9 \div 0.012$

12. In the following divisions, which quotient of these divisions will be larger than the dividend?

   (A) $1.2 \div 1.2$ (B) $3.5 \div 3.5$ (C) $0.8 \div 0.8$

13. A car has travelled 114.5 kilometres in 2.5 hours. How many kilometres did it travel in one hour?

14. A rectangular land has an area of 729 m^2. When its width is 22.5 m, find the length of this land.

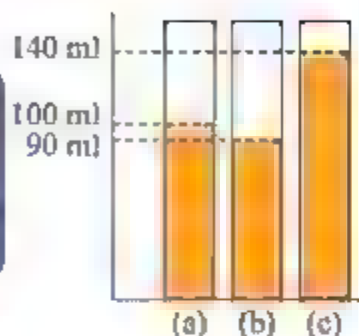
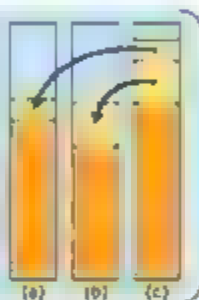
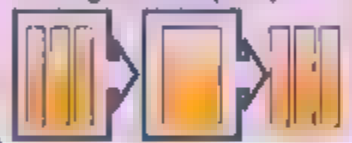
15. A 3.25 metre long iron bar weighs 15.6 kg. Find the weight per metre of this iron bar

2025

Chapter 8

Average

8.1. Average

We put orange juice of different quantities in 3 pots (a), (b) and (c) as shown on the right. How can we make equal amount of juice in all three pots.

How about moving the juice in the glass (c) to (a) and (b) until the height becomes the same?

I would put all the juice together and divide it into three glasses equally.

If we put together juice in all the glasses, then

$90 + 100 + 140 = 330$ (ml)

Therefore, from one orange, we can get juice

$330 \div 3 = 110$

amount of juice in one container: 110 ml

When a set of quantities is given, the value obtained by dividing the sum of these quantities by the number of quantities in the set is called the average of these quantities. This is calculated by the following formula.

Average = Sum of quantities ÷ Number of quantities

2025

Find the average:

(1) 4, 3, 7, 5, 3 (2) 3, 5, 8, 4, 2, 5, 2, 4, 3, 7

(3) 8, 9, 12, 11, 7, 10 (4) 17, 16, 20, 19, 15, 21

Reza recorded the time for his home study from Saturday to Thursday last week, and made the following table. How many hours a day in average did he study at home?

Day	Sat	Sun	Mon	Tue	Wed	Thu
Hour	2	1.5	1	1.5	1	2

We weighed three oranges in a box of twenty oranges, and found that these were 335g, 320g and 371g.

(1) Calculate the average weight of these 3 oranges

(2) Estimate the weight of 20 oranges in the box.

The teacher divided the students in the class into the boy group and girl group, and told them to calculate the average number of family members in each group. Then the students made the table as shown below. Find the average number of family members in the whole class.

	Number of students	Average number of family members
Boy group	18	4.5
Girl group	12	5.3

The total number of family members: $18 \times 4.5 + 12 \times 5.3 =$_____

Let's think step by step!

The total number of students: $18 + 12 =$_____

The average number of family members: _____

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8.2. Other Ways to Find the Average

The heights of 5 students are shown in the table below.

Name	Reza	Mina	Siyam	Taslima	Ujwal
Height (cm)	143	144	137	145	140

The average of these heights is equal to:

$$(143 + 144 + 137 + 145 + 140) \div 5 = 141.8 \text{ cm}$$

Discuss how we can find the average more easily by using the formula.

Reza's idea

As all the values are larger than 130, I have calculated the differences from 130 cm first, which are:

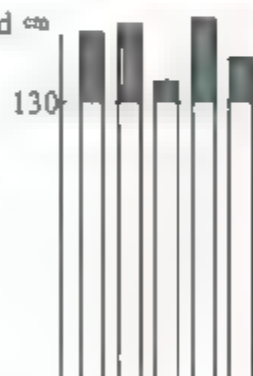
13 cm, 14 cm, 7 cm, 15 cm, 10 cm

Then I have calculated the average of these values.

$(13 + 14 + 7 + 15 + 10) \div 5 = 11.8$

Finally I have added 11.8 cm to 130 cm

$130 + 11.8 = 141.8$

Average: 141.8 cm

Meena's idea

As the smallest value is 137, I have calculated the differences from 137 cm first, which are

6 cm, 7 cm, 0 cm, 8 cm, 3 cm

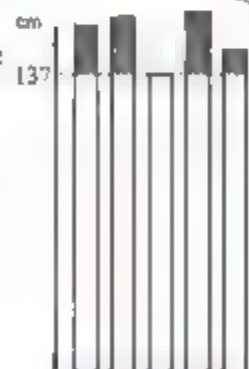
Then I have calculated the average of these values.

$(6 + 7 + 0 + 8 + 3) \div 5 = 4.8$

Finally I have added 4.8 cm to 137 cm

$137 + 4.8 = 141.8$

Average 141.8 cm

2025

Use any one of the previous methods to find the average of the following quantities.

(1) 96 m, 78 m, 89 m, 73 m, 80 m, 82 m

(2) 520 kg, 640 kg, 586 kg, 572 kg, 605 kg

The respective weights of eight eggs is as follows:

54 g, 56 g, 55 g, 58 g, 57 g, 50 g, 53 g, 51 g

Find the average weight of these eight eggs.

The following table shows the mathematics test scores of Group A and Group B students. The number of students in Group A is 5 and Group B is 3.

Group A	59	67	92	80	85
Group B	82	78	65		

Now we want to find the average score of all the students in Group A and B. Look at the idea of Reza below, and find what mistakes he has made.

Reza's idea

The average of Group A is (59 + 67 + 92 + 80 + 85) ÷ 5 = 76.6

The average of Group B is (82 + 78 + 65) ÷ 3 = 75

Therefore, the average score of all the students in Group A and B is

(76.6 + 75) ÷ 2 = 75.8

Average 75.8

The real average of these eight students is:

(59 + 67 + 92 + 80 + 85 + 82 + 78 + 65) ÷ 8 = 76

The method of average as in the Reza's idea does not indicate the real average as there is a difference between the numbers of students in 2 groups

Exercise 8

1. Find the average:

(1) 8, 10, 13, 7, 9, 10 (2) 38, 34, 32, 41, 30, 35, 33, 37

(3) 134, 136, 132, 138 (4) 957, 956, 948, 952, 960

2. The weight of 6 books is 924 grams. Find the average weight of these books.

3. The table below shows the amount of milk taken from one cow:

Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri
Milk (litre)	13	16	15	13	17	14	17

Find the average amount of milk that this cow gives one day.

4. The exam scores of Sohel and Hamida in Bangla, Mathematics, English, Science, and Bangladesh and Global Studies are as follows. Calculate each average score and determine which student performed better in this exam

	Bangla	Maths	English	Science	Bangladesh and Global studies
Sohel	68	95	56	90	65
Hamida	72	78	84	80	86

5. Statistics shows that the average maximum temperature in August in Dhaka is 32 °C Which of the following statements is true?

A) The maximum temperature in August is 32 °C every day.

B) The number of the days in August having temperature of 32 °C is more than the number of days in other months.

C) The temperature in August does not exceed 32 °C any day.

Chapter 9

Percentage

9.1. Comparison of quantity

In one school, there are 20 girls among 50 students in Grade 4, and 12 girls among 25 students in Grade 5. Discuss in which grade comparatively there are more girls.

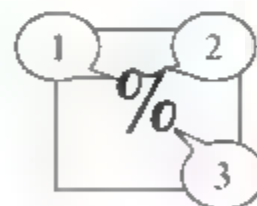
As 20 is larger than 12, I think there are more girls in Grade 4.

[illegible]	[illegible]	[illegible]
Grade 4	50	20
Grade 5	25	12

In fraction, girls in Grade 4 is $\frac{20}{50}$, but girls in Grade 5 is $\frac{12}{25}$. As $\frac{20}{50} = \frac{40}{100}$ and $\frac{12}{25} = \frac{48}{100}$, we have $\frac{20}{50} < \frac{12}{25}$. There are more girls in Grade 5, I think.

A ratio expressed as a fraction of 100 is called a **percentage**. It is denoted using the percent sign, "%".

[Example]

$$1\% = \frac{1}{100},\quad 15\% = \frac{15}{100},\quad 137\% = \frac{137}{100}\quad \text{etc}$$

Express the following quantities in fractions and decimals.

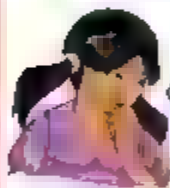
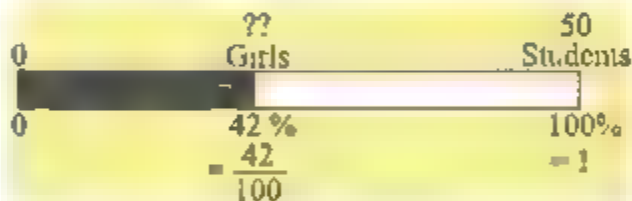
(1) 60% (2) 34% (3) 89% (4) 125%

Note that 100% is equivalent to $\frac{100}{100} = 1$

Express the following fractions and decimals by using the percent symbol %:

(1) $\frac{24}{100}$ (2) 0.54 (3) $\frac{21}{50}$ (4) 0.3 (5) $\frac{23}{20}$ (6) 0.03

There are 30 students in Grade 5 and 12 students are girls. What is the percentage of girls out of the total students?

There are 50 students in Grade 5 and 42% students are girls. How many girls are in the class?

Fill in the blanks:

(1) 25 litres are ____ % of 50 litres.

(2) ____ Kilograms are 20% of 120 kilograms.

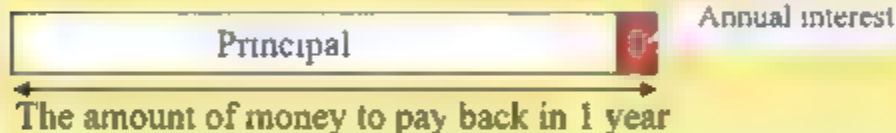
(3) 16 people are 32% of _____ people.

The population of Sakhipur village is 1280 and 40% of the population of that village is educated. Find the number of educated persons.

9.2. Simple Interest

If Jashim borrows Tk. 2000 from a bank with an annual interest rate of 6 %, how much money will he be paid back in one year?

The money borrowed or invested is called "**principal**", and the annual interest is calculated by the following formula.

$$\textbf{Annual Interest} = \textbf{Principal} \times \frac{\textbf{Annual Interest Rate}}{\textbf{100}}$$

Discuss how to solve the problems in the following cases.

(1) [The annual interest rate is unknown.]

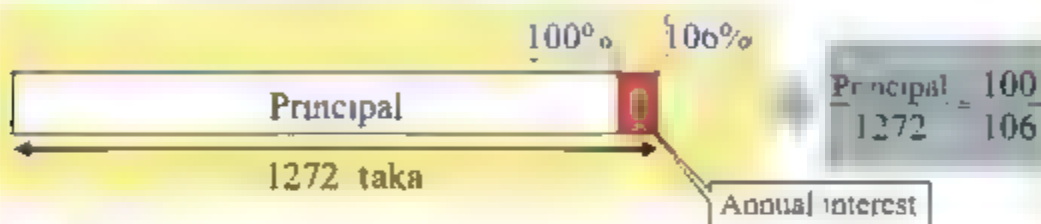
Sohel borrowed 800 taka from a bank, and paid back 856 taka in one year time. What was the annual interest rate?

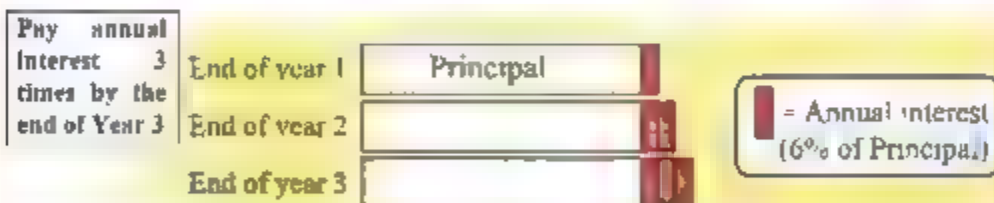
(2) [The principal is unknown.]

Amina borrowed some money from a bank with an annual interest rate of 5%, and paid the annual interest 30 taka. How much was the principal?

When we borrowed some money from a bank with an annual interest rate of 8%, we paid the annual interest 600 taka one year later. How much was the principal?

2025

Linkon borrowed some money from a bank with an annual interest of 6% He paid back 1272 Taka one year later. How much was the principal?

2 **Puja borrowed some money from a bank with an annual interest of 12 %, and paid the annual interest 1680 taka one year later. How much was the principal?**

Tanima borrowed 2000 taka from a bank for 3 years and an annual interest of 6 % is always charged on the principal. How much taka will she pay back in 3 years' time?

3 **Shamol Chakma borrowed 4500 taka from a bank and an annual interest of 8 % was always charged on the principal.**

(1) How much taka will he have to pay back after 10 years?

(2) After how many years the total interest will be Tk. 2520?

2025

9.3. Profit and Loss

When we buy and sell things in business, we normally gain or lose money.

- If a selling price is more than its cost price, then there will be **profit**.
- If a cost price is more than its selling price, then there will be **loss**.

Percentage profit (profit %) or percentage loss (loss %) is always calculated on the cost price.

Example

(1) If a pen is bought at 50 taka, and sold at 56 taka, then what is the profit %?

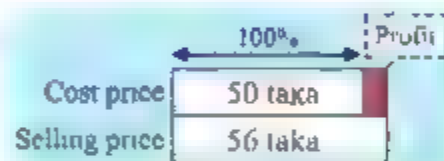
(2) If a notebook is bought at 15 taka and sold at 12 taka, then what is the loss %?

Answer

(1) There is a profit of $56 - 50 = 6$ taka.

Thus, the profit % is

$$\frac{\text{profit}}{\text{cost price}} \times 100 = \frac{6}{50} \times 100 = 12$$

So, profit is 12%

(2) There is a loss of $15 - 12 = 3$ taka.

Thus, the loss % is

$$\frac{\text{loss}}{\text{cost price}} \times 100 = \frac{3}{15} \times 100 = 20$$

So, loss is 20 %

A seller purchased a machine from a factory and sold it at 55200 taka with the profit of 15 %. How much was the cost price? Draw figures and discuss how to solve it with your classmates.

A seller laid a table in stock but sold it at 7040 taka after 12% discount from the cost price. How much was the cost price of the table?

Exercise 9

1. Fill in the blanks:
   (1) 12 people are _____ % of 20 people.
   (2) 150% of 300 Taka is _____ Taka.
   (3) 56% of _____ grams is 42 grams.

2. In a school, 30% students were absent among 80 students on Sunday How many students were present on that day?

3. Hosain's monthly income is 2500 taka and he spends 1,750 taka on food Shamim's monthly income is 1800 taka and he spends 1,440 taka on food.
   (1) Express the ratio of expense on food to the total income in percentage.
   (2) Who spends more portion on food?

4. Some money was borrowed from a bank with an annual interest of 15 % and the annual interest of Tk 1,680 was paid one year later. How much was the principal?

5. 15,000 taka was borrowed from a bank for 5 years with annual interest of 8 %. How much taka should be paid back 5 years later?

6. 50,000 taka was borrowed from a bank, and 98,000 taka was paid back 8 years later How much annual interest rate was charged on the principal?

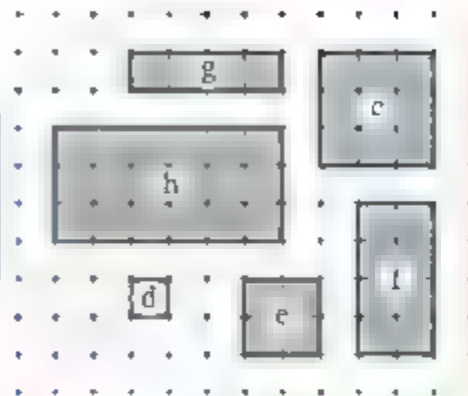
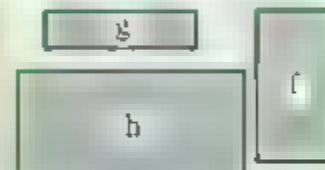
7. In a shop, an item of 1,800 taka was sold at a discount of 20% How much taka was the selling price?

8. A seller purchased a basket of vegetables from a farmer and sold them at a market at 6,300 taka with a profit of 40%. How much was the purchase price?

Chapter 10

Geometry

10.1. Rectangle and Square

Look at the figures shown on the right. Divide them into two groups.

Fill in the following tables and discuss with your classmates the same points and different points between groups A and B.

How about the sides?

	Number of sides	Length of sides
Group A		
Group B		

How about the angles?

	Number of angles	Degree of angles
Group A		
Group B		

Same points → (1) ________________ (2) ________________

Different points → (1) ________________ (2) ________________

2023

A figure surrounded by 4 straight lines is called a **quadrilateral**
A quadrilateral having four right angles is called a **rectangle**
A rectangle having four equal sides is called a **square**.

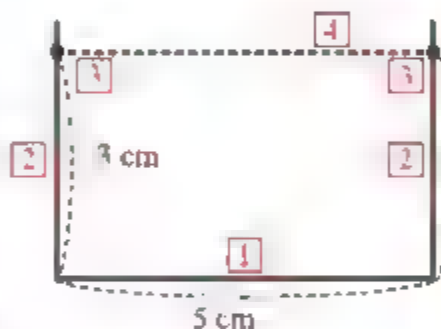
As we can see in the figures above, the opposite sides of rectangles and squares are **equal** and **parallel**.

Draw the following rectangle and square.

(a) Rectangle: width 5 cm, height 3 cm

(b) Square: each side 4 cm

How to draw a rectangle:

1. Use a ruler to draw a line of 5 cm.
2. Use set squares to draw two perpendiculars to the line drawn in Step (1).
3. Measure 3 cm in these two perpendiculars.
4. Connect two points marked in Step (3) to make a rectangle.

Draw the rectangles and squares:

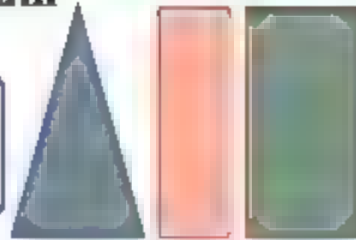
(1) Rectangle: base 2 cm, height 4 cm

(2) Rectangle: base 6 cm, height 3 cm

(3) Square: each side 5 cm

2025

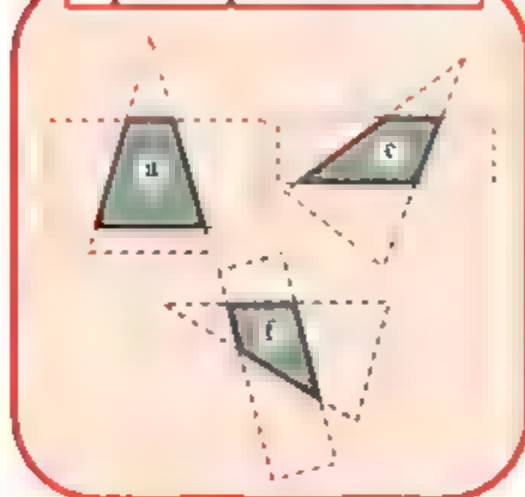
10.2. Parallelogram and Trapezium

Make quadrilaterals by overlapping the figures shown on the right. What shapes can we make?

We know that rectangle's two pairs of opposite sides are equal and parallel.

Divide these 6 quadrilaterals into groups paying attention to parallel sides.

Parallel sides	Quadrilaterals
1 pair of sides is parallel	
Both pairs of sides are parallel.	

Is there a rectangle in these 6 quadrilaterals? If there is, write the reason that you think of it as a rectangle.

A quadrilateral having one pair of parallel sides is called a **trapezium.**

A quadrilateral having two pairs of parallel sides is called a **parallelogram.**

1 **Find trapeziums and parallelograms in the following figures. Also give reason why you think of it as a trapezium and parallelogram:**

Measure the sides and angles of the following parallelograms. What can you find about the sides and angles of a parallelogram?

(1) Length of opposite sides → ____________________

(2) Opposite angles → ____________________

In a parallelogram,
- **Opposite sides are equal in length.**
- **Opposite angles are equal.**

2 **Find the length of the following sides and the angles in the given parallelograms:**

(1) AD =____cm

(2) CD =____ cm

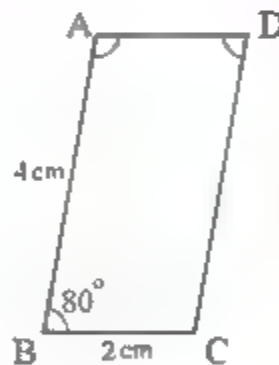
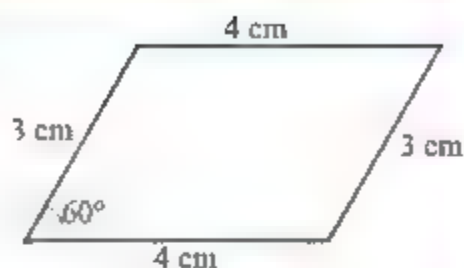
(3) ∠D =____°

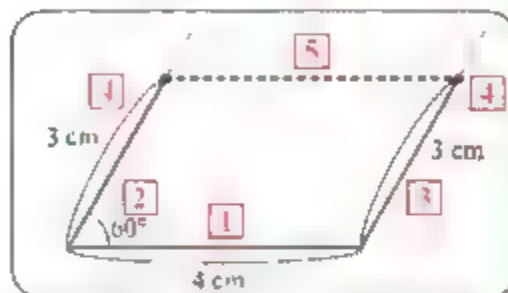
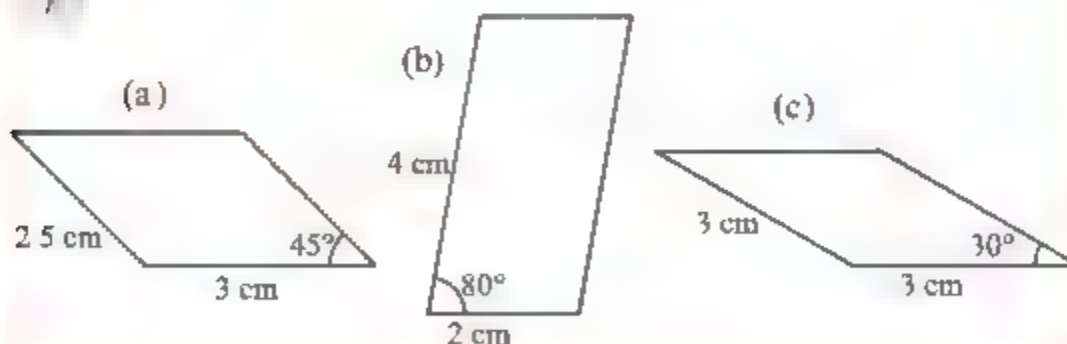
(4) ∠A =____°

(5) EH =____ cm

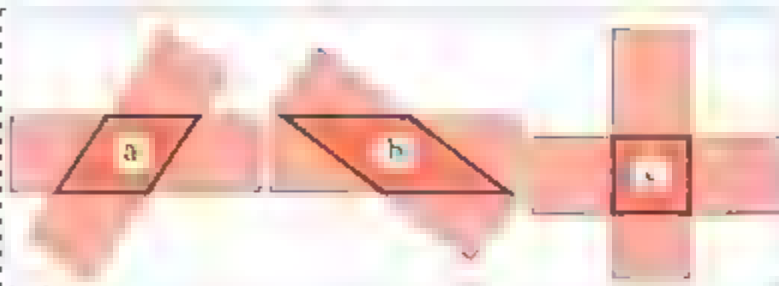
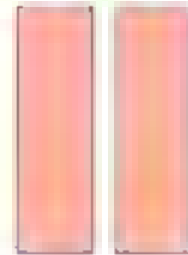
(6) EF =____ cm

(7) ∠H =____°

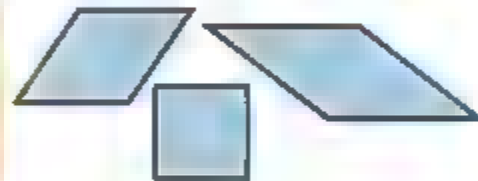
(8) ∠G =____°

Draw the parallelogram on the right on the notebook.

How to draw a parallelogram:

1. Use a ruler to draw a line of 4 cm.
2. Use a protractor to draw an angle of 60°.
3. Use Set square to draw a line that is parallel to the line drawn in Step (2).
4. Measure 3 cm on the lines drawn in Step (2) and (3).
5. Use a ruler to draw a line which connects two points measured in Step (4)

10.3. Rhombus

Make quadrilaterals by overlapping two same rectangles shown on the right. What shapes can we make?

a b c

Let's measure the length of sides!

The four sides in each figure are equal in length.

- If all the sides of a quadrilateral are equal in length, it is called a rhombus
- Square is a kind of rhombus.

Use set squares and a protractor to see (1) if opposite sides are parallel, and (2) if opposite angles are equal.

(1) Opposite sides

→ ____________

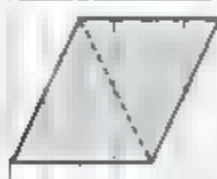
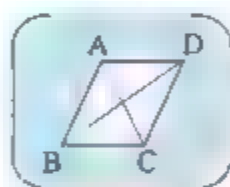
(2) Opposite angles

→ ____________

In a rhombus,

- **Opposite sides are parallel.**
- **Opposite angles are equal.**

10.4. Diagonals of a quadrilateral

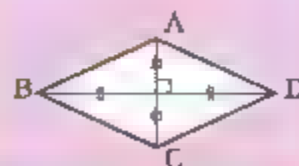
Connect two pairs of the opposite vertices in each of the following parallelograms and rhombuses. What can you find in these lines?

A line segment joining two opposite pairs of vertices is called a **diagonal.**
A quadrilateral has two diagonals, but a triangle does not have any diagonal.

Look at the diagonals you have drawn above, and answer the following questions.

(1) At what point do two diagonals of each parallelogram meet?

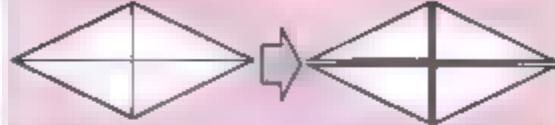
(2) At what point do two diagonals of each rhombus meet?

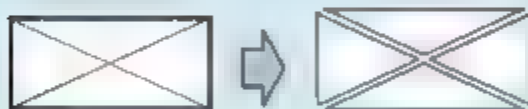
(3) How do two diagonals of a rhombus intersect?

Summary:

- In a parallelogram, one diagonal meets the other at the **mid-point**.
- In a rhombus, one diagonal meets the other at the **mid-point**, and two diagonals are **perpendicular** to each other.

Cut parallelogram-shaped and rhombus-shaped papers along the diagonals. Compare the sides and angles of four triangles that you have cut out. What can you find?

Parallelogram

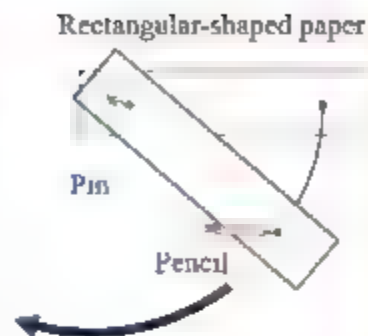
Rhombus

Cut a rectangle and a square along the diagonals into four triangles. What properties do the diagonals of a rectangle and a square have?

Rectangle

Square

In the table below, fill in the blank boxes to summarize what we have found about quadrilaterals.

	All the sides are always equal in length	All the angles are always right angle	Opposite sides are always:		Diagonals are always:	
			Parallel	Equal in length	Bisect each other	Intersect each other perpendicularly
Parallelogram	No					
Rhombus	Yes					
Rectangle	No					
Square	Yes					

10.5. Circle

Collect a pin, a pencil, and a rectangular-shaped paper with two small holes, and use them as shown on the right to draw a curved line on a notebook. If we move the pencil one round, what figure can we make?

If we move the pencil one round, we will obtain a beautiful round shape. This round shape is called a **circle**. A curved line that bound a circle is called a **circumference**. A circle is a closed curved line in which all the points on the curve are in the same distance from the centre

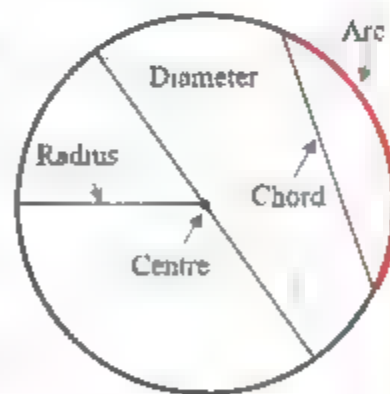
Do all the points on the circumference have the same distance from the centre? Why? Discuss in the classroom.

The parts of a circle are as shown on the right.

Radius is the distance from the centre to the circumference.

Arc is a part of a circumference.

Chord is a line segment that connects two endpoints of an arc.

Diameter is a chord that passes through the centre. Diameter is the largest chord of circle.

What is the relationship between the radius and the diameter of a circle?

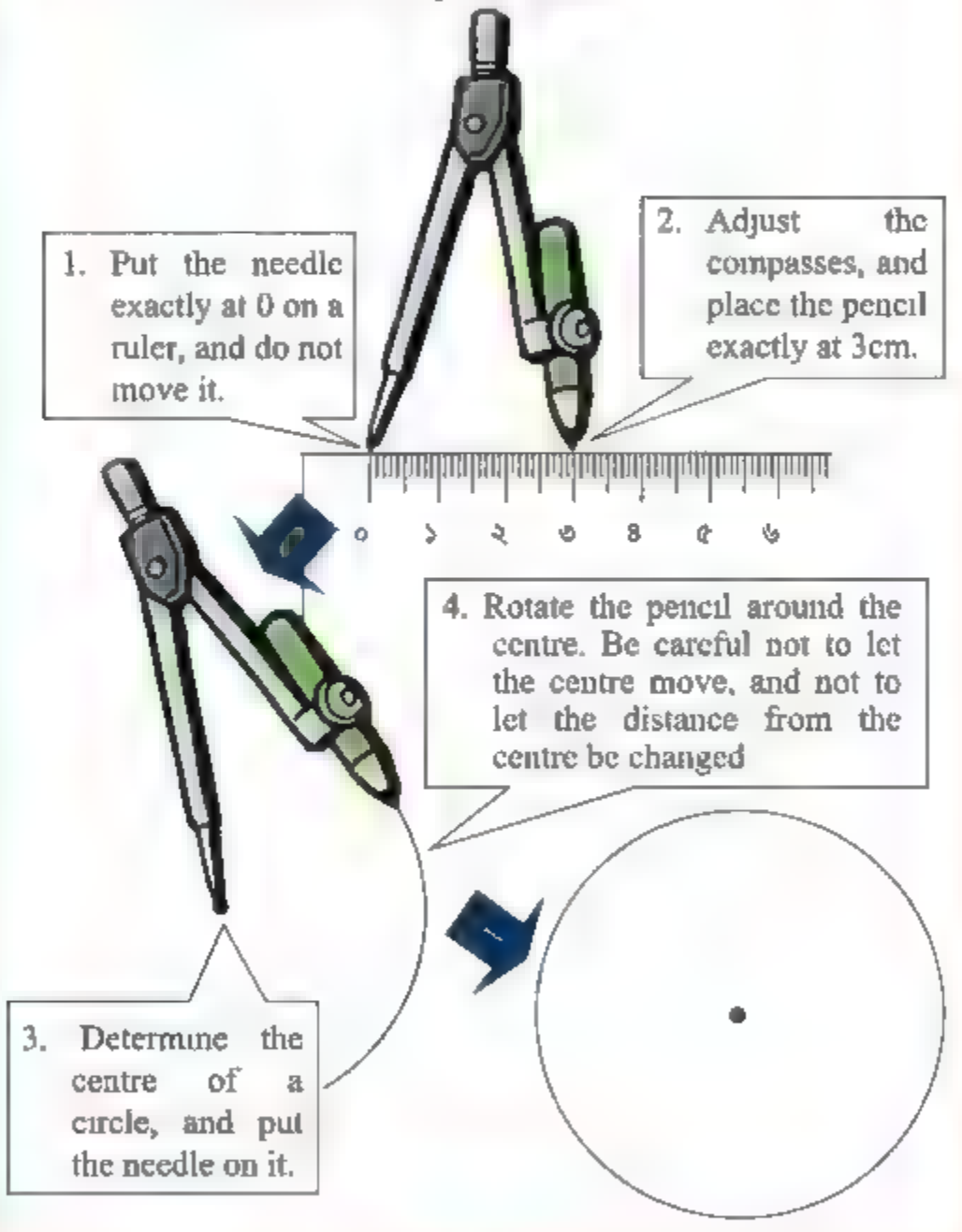
2025

Use compasses to draw circles that have the following radius.

(1) 3 cm (2) 2.5 cm

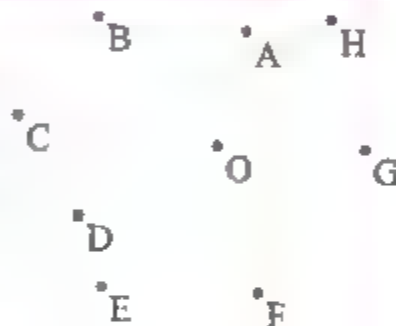
How to draw a circle with a given radius

1. Put the needle exactly at 0 on a ruler, and do not move it.
2. Adjust the compasses, and place the pencil exactly at 3cm.
3. Determine the centre of a circle, and put the needle on it.
4. Rotate the pencil around the centre. Be careful not to let the centre move, and not to let the distance from the centre be changed

2025

Make a design and a picture using circles.

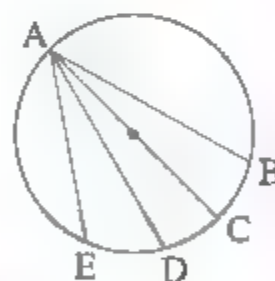
I have made a face by circles of different radius.

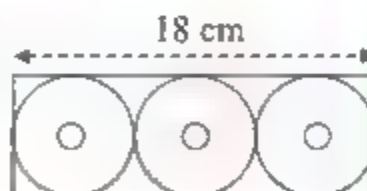
I have made a beautiful design like this.

There are points from A to H around the point O as shown on the right. Take O as centre and draw circles using compass through the points mentioned. Find the point that is farthest from the point O.

Which one of the line segments in the circle on the right is the longest?

Draw the following circles:

(1) A circle having a radius of 35 mm.

(2) A circle having a diameter of 44 mm.

We put 3 CDs in a box whose length is 18 cm as shown on the right. What is the radius of a CD?

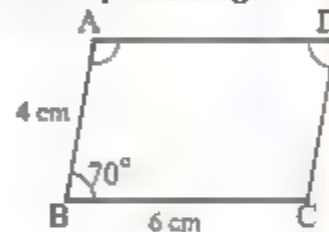
2025

Exercise 10

1. The lines (a) and (b) are parallel. Look at the example below and draw 1 trapezium and 2 parallelograms by using these lines.

2. Find the following length of sides and the angles of the parallelogram on the right :

(1) AD=___cm　　(2) CD=___cm

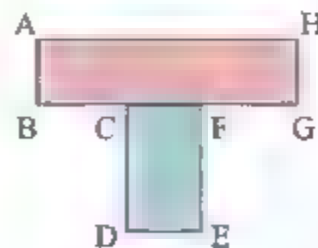
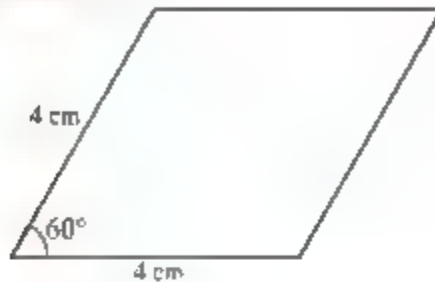
(3) ∠D= ___°　　(4) ∠A= ___°

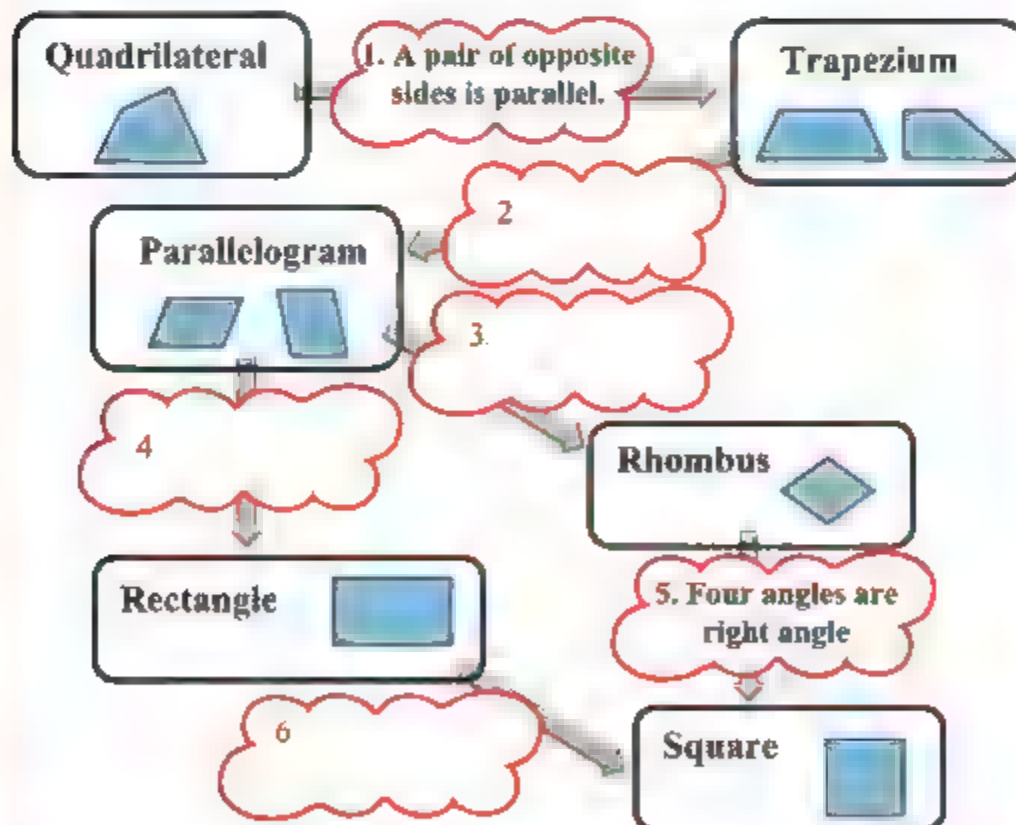
A　D
4 cm
70°
B　6 cm　C

3. The following figures only show the diagonals of quadrilaterals. Draw the quadrilaterals and find the name of each quadrilateral:

(1)

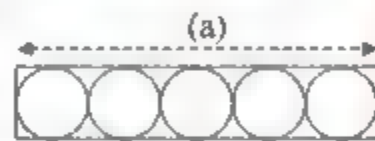
(2)

(3)

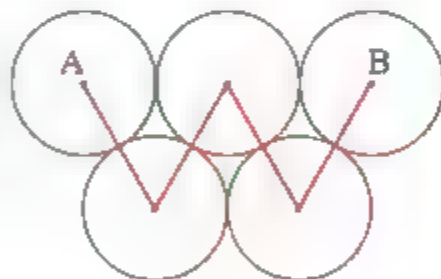
4. The figure on the right is made by combining two rectangles. Find the sides that are perpendicular to the side DE.

5. Draw the following quadrilaterals:

6. Fill in the charts of 2, 3, 4, 6 by writing the conditions given in the charts 1 and 5. For example, we obtain a trapezium if we add a condition 'a pair of opposite sides is parallel' to a general quadrilateral

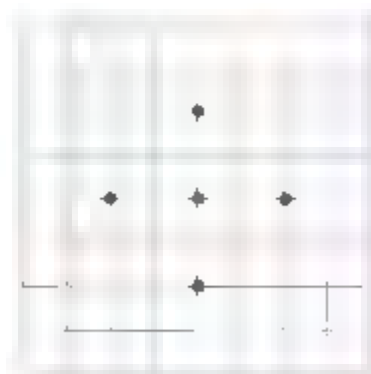
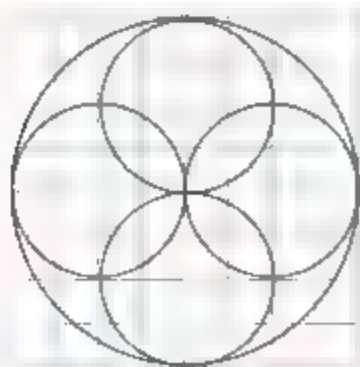
2025

7 Fill in the blanks in the following sentences regarding the circle

- The distance from the centre to the circumference is (a) . . . .
- A part of a circumference is (b) ... . ______
- A line segment that connects two endpoints of (b) is (c) . .
- If (c) passes through the centre, then it is called (d) . . . . . .
- If (d) is 10 centimetres, then (a) is ______ .. ______ centimetres.

8. We put 5 plates in a box as shown on the right. Answer the following questions:

(1) When the radius of each plate is 8 cm, find the length of (a).

(2) When (a) is 80 cm, find the diameter of each plate

9. We draw 5 circles whose diameter equals 4 cm. When we connect the centres as shown on the right, find the length of broken-line segments drawn from A to B.

10 Use compasses to make the same design as on the left

2025

Chapter 11

Measurement

11.1. Length

What units of length have we learnt so far? What is the relationship between the units of length?

The following chart shows the units of length. How many units have we ever seen in our surroundings?

Units of Length

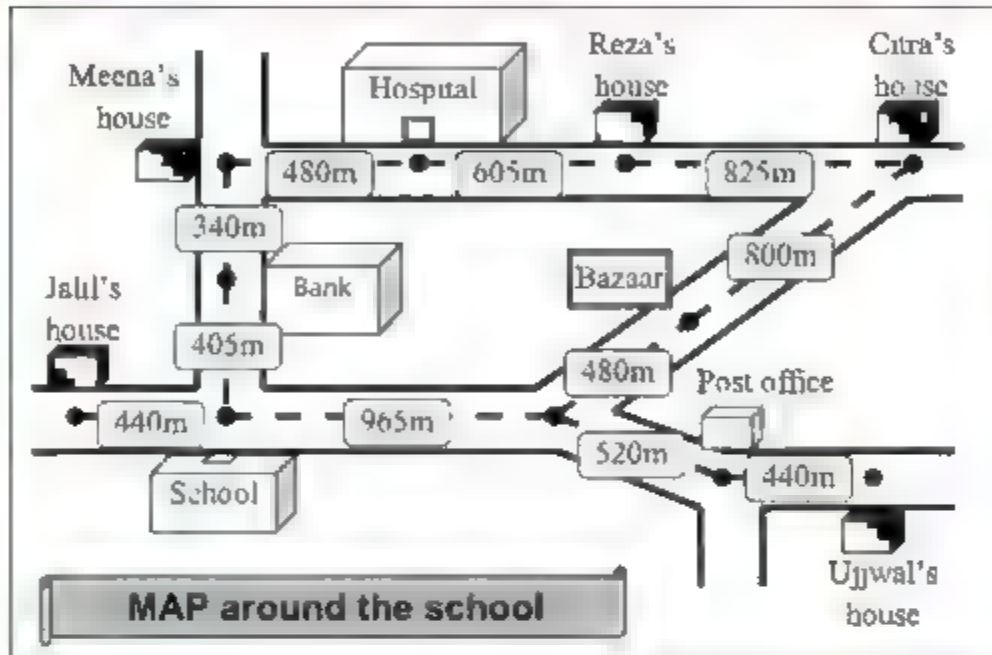
Big	1	kilometre	(km) =	1000	m		
	1	hectometre	(hm) =	100	m		
	1	decametre	(dam) =	10	m		
	1	**metre**	**(m) =**	**1**	**m**		
Small	1	decimetre	(dm) =	0.1	m	=	$\frac{1}{10}$ m
	1	centimetre	(cm) =	0.01	m	=	$\frac{1}{100}$ m
	1	millimetre	(mm) =	0.001	m	=	$\frac{1}{1000}$ m

Discuss with your friends what numbers you can put in the blank boxes.

(1) 1234 m = ☐ km ☐ m = ☐ km ☐ hm ☐ dam ☐ m

(2) 3050 m = ☐ km ☐ m = ☐ km ☐ dam

2025

Look at the map around Reza's school. Try to use a variety of units of length to express the distance.

(1) How far is it from Citra's house to the school?

(2) Reza can go to school via Bank or Bazaar. Which way is shorter than the other?

(3) Make your mathematical problems using this map

1 **Calculate the following addition and subtraction, and express the answer using the units in the bracket:**

(1) 3042 m + 2078 m	(km, hm, dam)
(2) 12km 510m + 25 km 720 m	(km, dam)
(3) 8520 m − 3490 m	(km, hm, dam)
(4) 5 km 320m − 3280m	(km, dam)

2 **If Reza walks 54 metres a minute, how many kilometres will he walk in an hour?**

11.2. Weight

What units of weight have you learnt so far? What is the relationship between the units of length?

The following chart shows the units of weight. How many units have we ever seen in our surroundings?

Units of weight

Big ↑					
1	kilogram	(kg)	=	1000	g
1	hectogram	(hg)	=	100	g
1	decagram	(dag)	=	10	g
1	**gram**	**(g)**	**=**	**1**	**g**

There are many units. I cannot remember all!

Kilo, hecto, deca … These are the same with the units of length, aren't they?

Discuss with your friends what numbers you can put in the blank boxes.

(1) 6285g = ☐ kg ☐ g = ☐ kg ☐ hg ☐ dag ☐ g

(2) 9060 g = ☐ kg ☐ g = ☐ kg ☐ dag

(3) 1 kg 382 g = ☐ hg

(4) 25 kg 800 g = ☐ dag

(5) 750 g = ☐ kg

2025

There is another unit to measure much heavier weight.

100 kilogram (Kg) = 1 Quintal, 10 quintal = 1 metric ton 1000 kilogram (Kg) = 1 metric ton

About 1.5 metric tons

For example, the weight of small cars is from 1 to 2 metric tons and buses is around 8 to 10 metric tons. The weight of big aircrafts is more than 400 metric tons.

About 9 metric tons

Choose the most appropriate unit in the bracket to weigh the following items.

(1) Your weight (g, kg, metric ton) (2) Book (g, kg, metric ton)

(3) Airplane (g, kg, metric ton) (4) Salt for cooking (g, kg, metric ton)

1 **Write an appropriate inequality sign, > or <, in the blank boxes:**

(1) 2.5 kg ☐ 1800 g (2) 3600 kg ☐ 4 metric ton

(3) 840 kg ☐ 0.7 metric ton

2 **Calculate the following addition and subtraction, and express the answer using the units in the bracket:**

(1) 4523g + 3388 g	(kg, hg, dag, g)
(2) 21kg 340g + 25 kg 750 g	(kg, dag)
(3) 8520g – 3490 g	(kg, hg, dag)
(4) 12 kg 250 g – 3280 g	(kg, dag)

3 **How many students of 30 kg are required to make a weight equal to a car of 1.5 metric tons?**

How many?

2025

11.3. Volume

What units for volume have you learnt so far? What is the relationship between the units of length?

The following chart shows the units of volume. How many units have you ever seen in your surroundings?

Units of volume

Big ↑	1	kiloliter	(kl)	=	1000	L		
	1	hectoliter	(hl)	=	100	L		
	1	decaliter	(dal)	=	10	L		
	1	**liter**	**(L)**	**=**	**1**	**L**		
Small ↓	1	deciliter	(dl)	=	0.1	L	=	$\frac{1}{10}$ L
	1	centiliter	(cl)	=	0.01	L	=	$\frac{1}{100}$ L
	1	milliliter	(ml)	=	0.001	L	=	$\frac{1}{1000}$ L

Discuss with your friends what numbers you can put in the blank boxes.

(1) 4050 L = ☐ kl ☐ dal

(2) 5 L 585 ml = ☐ cl

(3) 4 kl 5 L = ☐ L

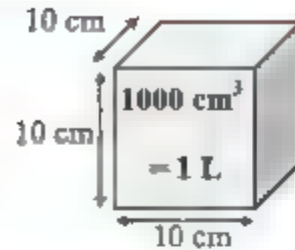
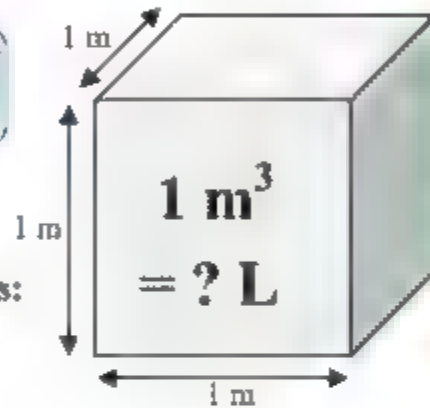
(4) 8 L 20 ml = ☐ ml

(5) 750 ml = ☐ L = ☐ cl

(6) 21.56 L = ☐ dal = ☐ cl

2025

There is another unit to measure volume.

> **1000 cubic centimetres (cm^3) = 1 litre (L)**

Discuss with your friends how many litres are equal to 1 cubic metres (m^3).

Write, > or <, in the blank boxes:

(1) 50 L ☐ 5000 ml

(2) 6350 daL ☐ 2 kl

(3) 300 L ☐ $1m^3$

Calculate the following addition and subtraction, and express the answer using the units in the bracket:

(1) 3283 mL + 2649 ml	(L, dal , cl , ml)
(2) 21 L 540 ml + 12 L 625 ml	(L, cl)
(3) 852 L − 349.8 L	(kl)
(4) 325 cL − 12.5 cl	(L, ml)

3

A can contains 250 ml of orange juice. When we buy 40 cans of this orange juice, how many litres of orange juice will we have?

Exercise 11 (a)

1. Raju's height is 1.35 m and his brother's height is 9.6 dm. How much is the difference in their height? Write it in centimetres.

2. A tailor has 375 decimetres of cotton cloth and wants to make 15 shirts from it. How many centimetres can he use for one shirt?

3. Reza walks 45 metres a minute, and Meena walks 80 centimetres a second. Who can walk faster?

4. Latif went to a market, and bought 3.5 kg of rice, 8 kg of vegetables, and 2400 g of meat. How many kilograms of items did he buy?

5. A book weighs 124 grams. How many kilograms will there be if there are 80 books?

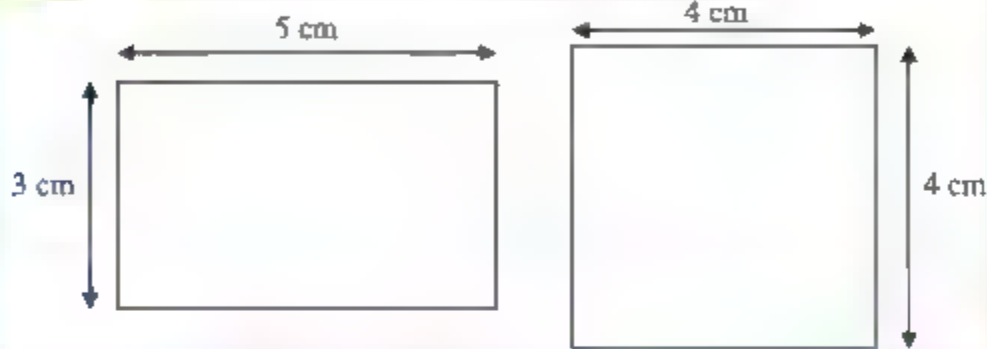
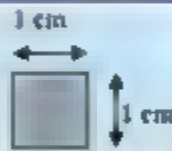
6. There are 8 people and their total weight is 451.2 kg. What is the average weight in hectogram of these 8 people?

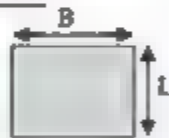
7. There were 75 cL of oil in a bottle. How many litres of oil would be left in the bottle if Santi used 180 ml of it?

8. A can contains 350 ml of mango juice. How many litres of mango juice will there be if there are 24 cans?

9. A family used up a tank of 20 L drinking water in 8 days. In average, how many decilitres of water did they use in a day?

11.4. Area of rectangles

There are a rectangle and a square as shown below. Which one is much larger than the other?

Formula for a rectangular area

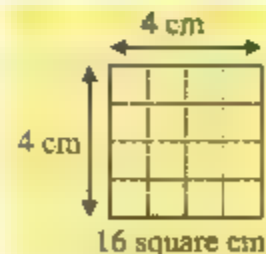
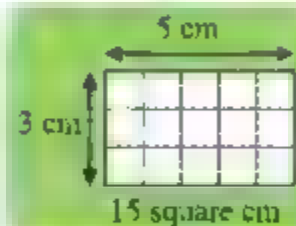
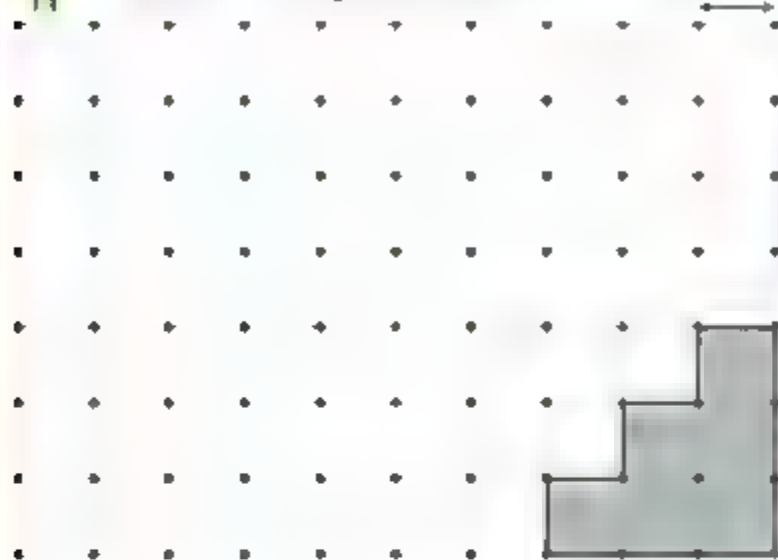
Area
= Breadth (B) × Length (L)

[Solution]

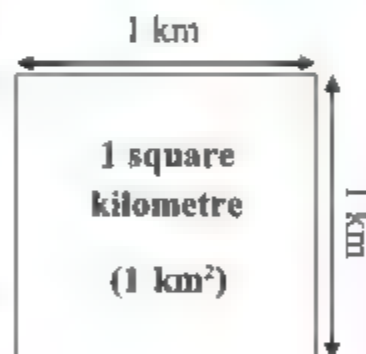
The area of the rectangle is: $5\,cm \times 3\,cm = 15\ (cm^2)$

The area of the square is: $4\,cm \times 4\,cm = 16\ (cm^2)$

The difference is $16 - 15 = 1\ (cm^2)$

Therefore, the square is 1 cm^2 larger than the rectangle.

2025

Make a figure of 6 square cm using the following sheet, and share it with your friends.

There are other units to measure larger areas:

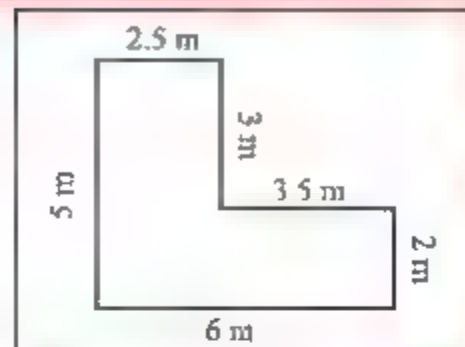
- **'1 are'** is 100 m^2. This equals a square area whose side is 10 metres.
- **'1 hectare'** is 10000 m^2. This equals a square area whose side is 100 metres.
- **'1 square kilometre'** is equal to a square area whose side is 1 kilometre.

Discuss in pairs how many square metres are equal to 1 square kilometre.

1

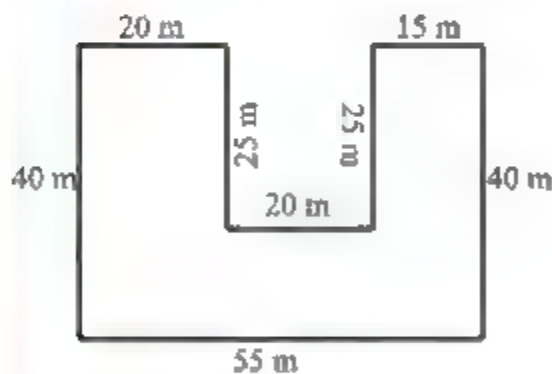
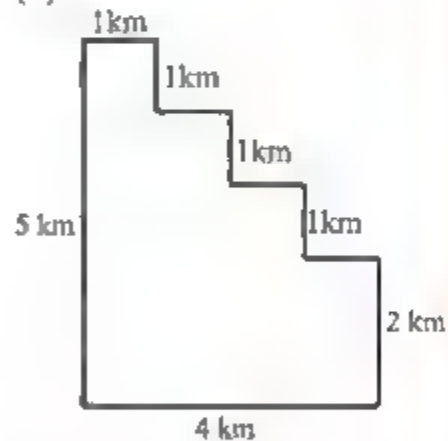
Fill in the blank boxes:

(1) 1 hectare = ☐ are (2) 1 square km = ☐ hectare

2025

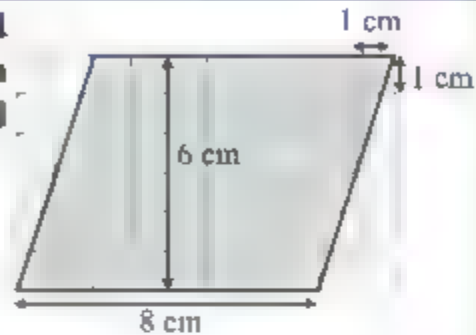
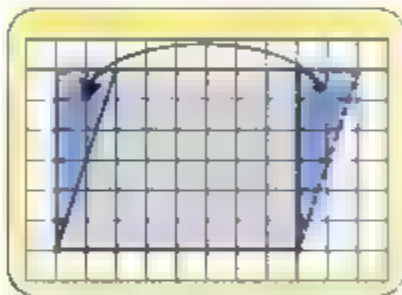
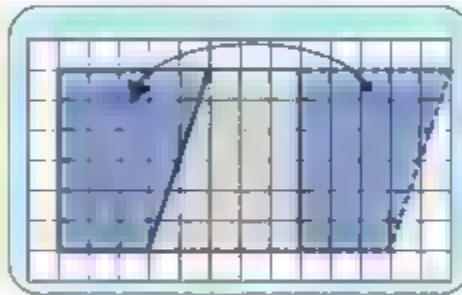
How many square meters are the areas of the L-shape land shown on the right? Discuss with friends in how many ways you can calculate it.

How can I use the formula for the area of rectangles?

There are various ways to find the area of this shape.

2 **Calculate the area of the following figures:**

3 **Try to find several ways to find the area of the figures above.**

2025

11.5. Area of parallelograms

Consider the way to find the area of a parallelogram of which base is 8 cm and height is 6 cm.

There are several ways to find the area of a parallelogram using the formula for a rectangular area.

Discuss with your friends:

(1) If we use Reza's approach, the area of this parallelogram is

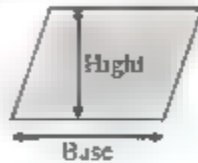
$\square \times \square = \square$ cm²

(2) If you use Meena's approach, the area of this parallelogram is

$\square \times \square = \square$ cm²

(3) From the results of (1) and (2), what can we conclude?

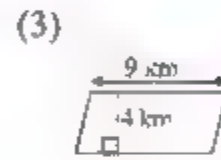
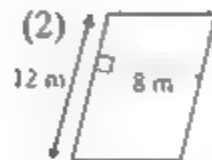
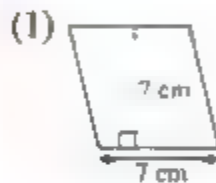
Formula for a parallelogram area

Area of a parallelogram
= Base × Height

This is the same with the formula for a rectangle

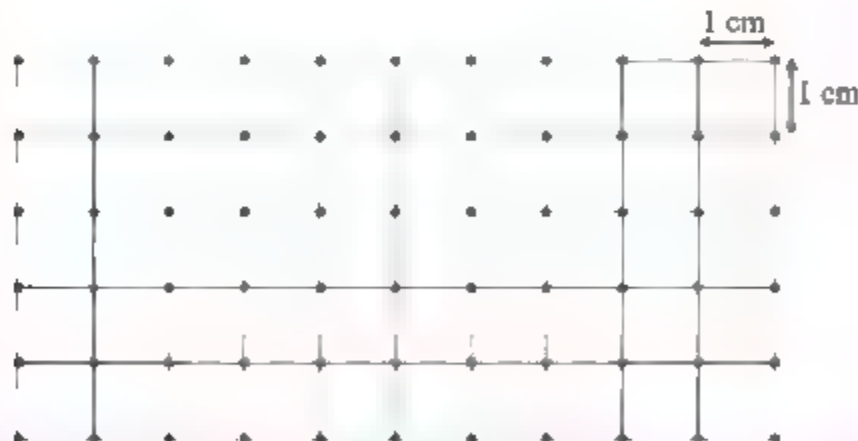
1 **Calculate the area of the parallelograms:**

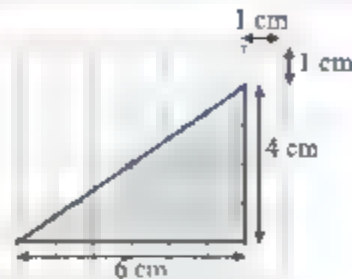
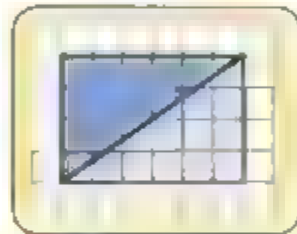
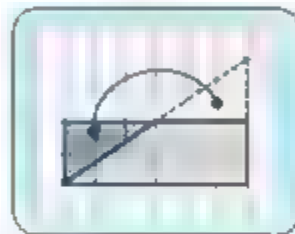
(1)

(2)

(3)

2 **Calculate the area of the parallelograms:**

(1) Base = 8 cm, Height = 6 cm
(2) Base = 2 cm, Height = 12 cm
(3) Base = 3 m, Height = 5 m
(4) Base = 2.5 km, Height = 2 km

3 **In the graph paper below, draw a parallelogram whose area is 6 cm^2:**

11.6. Area of triangles

Consider the way to find the area of a right-angle triangle of which base is 6 cm and height is 4 cm as shown on the right.

Let's think about how we can find out the formula of the area of a triangle.

Reza:
I have cut a rectangle into half to make this triangle.

Meena:
I have moved a small triangle to make a rectangle.

Discuss with your friends:

(1) If we use Reza's approach, the area of this triangle is:

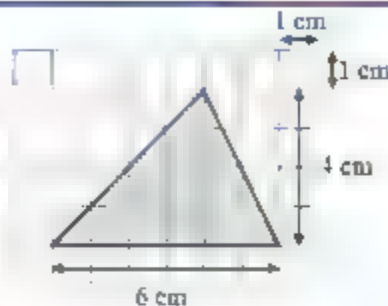
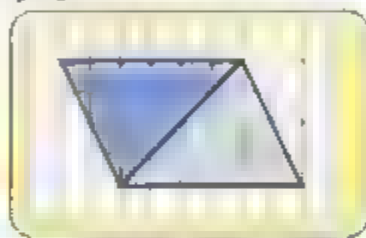
$\square \times \square \div 2 = \square$ cm²

(2) If we use Meena's approach, the area of this triangle is:

$\square \div 2 = \square$ cm $\quad \square \times \square = \square$ cm²

(3) From the results of (1) and (2), what can we conclude?

2025

Consider the way to find the area of an acute triangle of which base is 6 cm and height is 4 cm as shown on the right.

Let's think about these questions in the way we have learnt in the previous page.

Reza:
I have cut a parallelogram into half to make this triangle.

Meena:
I have moved two small triangles to make a rectangle.

Discuss with your friends:

(1) If we use Reza's approach, the area of this triangle is:

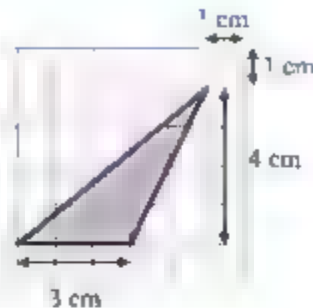
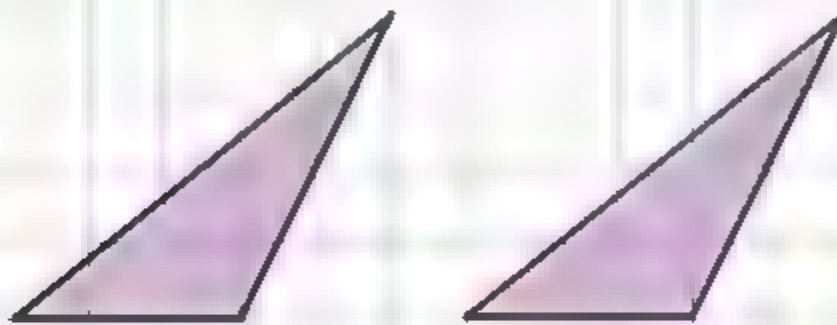
$\square \times \square \div 2 = \square$ cm^2

(2) If you use Meena's approach, the area of this triangle is

$\square \div 2 = \square$ cm $\quad \square \times \square = \square$ cm^2

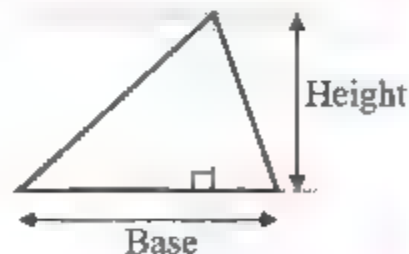
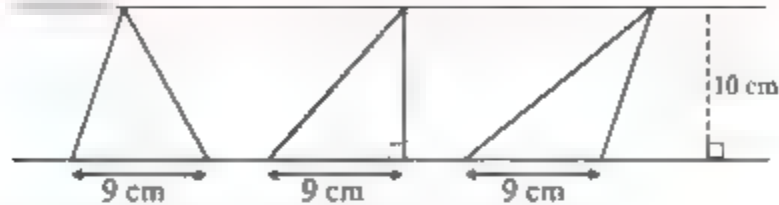
(3) From the results of (1) and (2), what can we conclude?

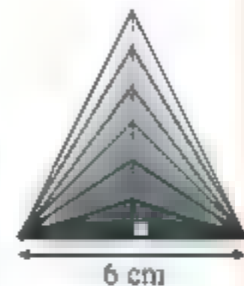
(4) Are there any different ways to find the area of this triangle?

Consider the way to find the area of an obtuse triangle of which base is 3 cm and the height is 4 cm as shown on the right.

Let's explain how to find the area using the following graph paper

Discuss with your friend the way to calculate the area of the above triangle. Compare the ways that we have learnt in 127 to 129 pages.

Formula for a triangular area

Area of a triangle
= (Base × Height) ÷ 2

2025

Calculate and compare the area of the following three triangles drawn between the parallel lines with 10 cm distance. Share with your friend what you have found in this activity

There is a triangle whose base is 6 cm. If its height increases from 1 cm to 6 cm, then how will its area increase?

Height (cm)	1	2	3	4	5	6
Area (cm^2)						

1 **Calculate the area of the following triangles:**

(1) Base = 4 cm, Height = 3 cm (2) Base = 5 cm, Height = 7 cm

(3) Base = 5 m, Height = 5 m (4) Base = 2 km, Height = 2.5 km

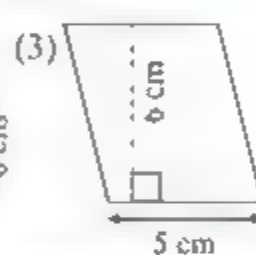
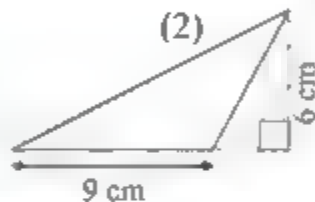
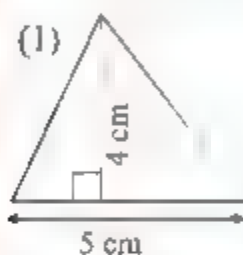
2 **In the graph paper below, draw triangles whose area is 6 cm^2.**

Exercise 11 (b)

1. Write a correct word in the blank boxes:

   (1) Area of a parallelogram = ☐ × ☐

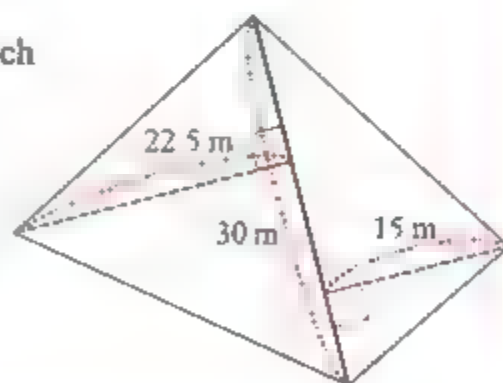
   (2) Area of a triangle = ☐ × ☐ ÷ 2

2. Calculate the area of the following figures:

3. There is a rectangular-shaped paddy field of which width is 750 metres and length is 1200 metres. What is the area of this paddy field?

4. The width of a rectangular-shaped park is 50 metres and its area is 4250 square metres. What is the length of this park?

5. The height of a triangle is 0.8 km and its area is 1.2 square km, then how many kilometres is the base?

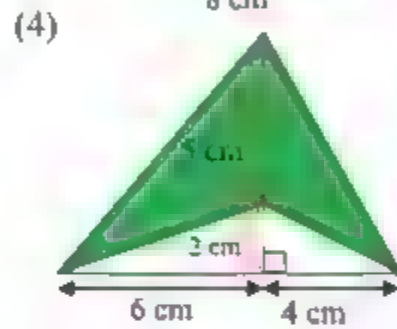
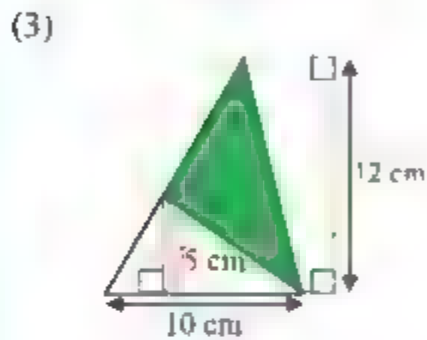
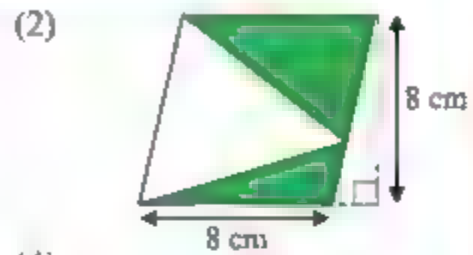
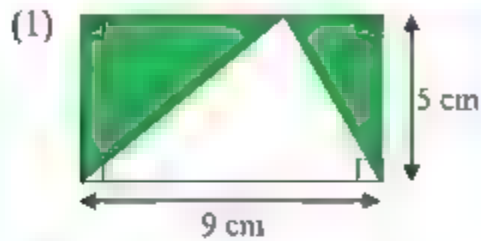
6. There is a quadrilateral field of which one of the diagonals is 30 m, and the distance from the diagonal to the opposite vertices is 15 m and 22.5 m as shown on the right. Calculate the area of this quadrilateral.

2025

7 Calculate the area of the coloured parts in the following figures

(1)

(2)

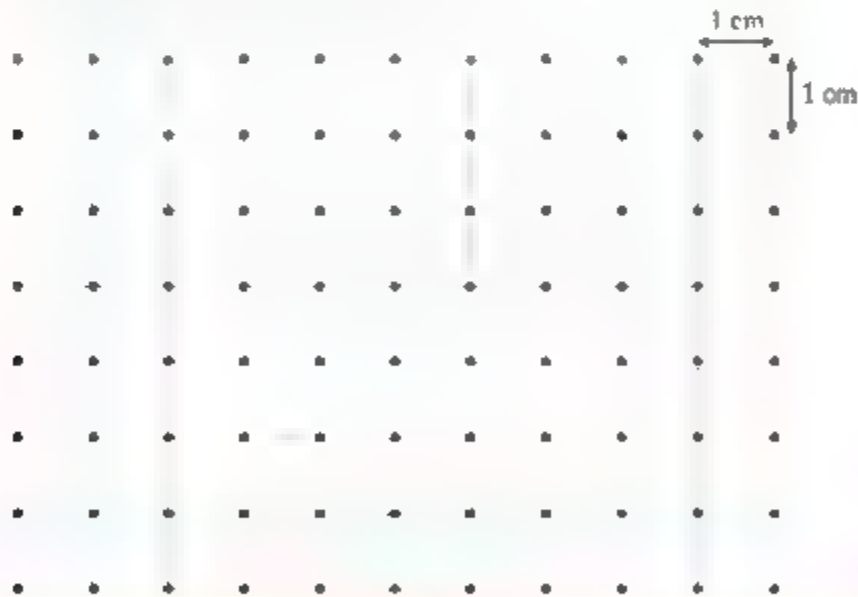
(3)

(4)

8. Draw the following figures using the graph paper.

(1) A triangle with an area 9 cm^2

(2) A rectangle with an area 8 cm^2

(3) A parallelogram with an area 6 cm^2

2025

Chapter 12

Time

12.1. Calendar

When is your birthday? Tell your friends on what day of what month you were born.

My birthday is 27Ashar, 1412. Ashar is the 3rd month in Bangla calendar. When is your birthday?

Bangla Calendar

	Month	Number of Days
1	Baishakh	31
2	Jaisthya	31
3	Ashar	31
4	Shrabon	31
5	Bhadra	31
6	Ashwin	30
7	Kartik	30
8	Agrahyon	30
9	Paush	30
10	Magh	30
11	Falgun	30
12	Chaitra	30

Discuss the Bangla calendar on the right.

(1) How many days are equal to one year in Bangla calendar?

(2) How many days does each month have?

Let's share anything you have found in the calendar with your classmates.

Look at Magh month of Bangla year 1421, and discuss in the classroom what you can find from it.

Magh of Bangla Year 1421

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

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Discuss the English calendar on the right.

(1) How many days are equal to one year in English calendar?

(2) How many days does each month have?

(3) What are the similarities and differences between Bangla and English calendar?

Let's share anything you have found in the calendar with your classmates.

English Calendar

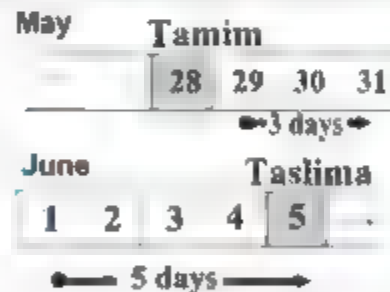
	Month	Number of Days
1	January	31
2	February	28
3	March	31
4	April	30
5	May	31
6	June	30
7	July	31
8	August	31
9	September	30
10	October	31
11	November	30
12	December	31

Tamim's birthday is 28th May. Taslima's birthday is 8 days after Tamim's birthday, When is her birthday?

Reza's idea

May will end 3 days after Tamim's birthday, and then June will start. Taslima's birthday will be June 5, because $8 - 3 = 5$.

May — Tamim: 28 29 30 31 (3 days)

June — Taslima: 1 2 3 4 5 (5 days)

Meena's idea

Add days: $28 + 8 = 36$ Because May has 31 days, Taslima's birthday will be June 5 by calculating $36 - 31 = 5$

May — Tamim: 28 29 30 31 | June: 1 2 3 4 5 — Taslima (8 days)

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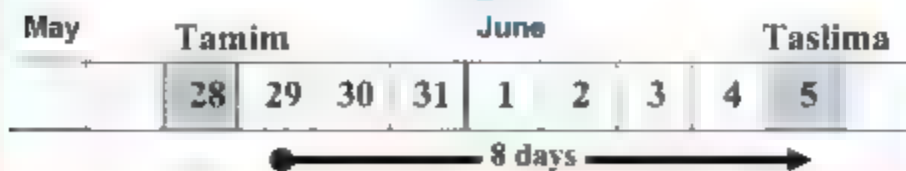
1 **Look at the calendar of English year 2016 below and Bangla year 1422-1423, and answer the following questions.**

2016
1422 Bangla

January Poush-Magh

Sun	Mon	Tue	Wed	Thur	Fri	Sat
31 (8)					1 (18)	2 (19)
3 (20)	4 (21)	5 (22)	6 (23)	7 (24)	8 (25)	9 (26)
10 (27)	11 (28)	12 (29)	13 (30)	14 (1)	15 (2)	16 (3)
17 (4)	18 (5)	19 (6)	20 (7)	21 (8)	22 (9)	23 (10)
24 (11)	25 (12)	26 (13)	27 (14)	28 (15)	29 (16)	30 (17)

February Magh-Falgun

Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1 (19)	2 (20)	3 (21)	4 (22)	5 (23)	6 (24)
7 (25)	8 (26)	9 (27)	10 (28)	11 (29)	12 (30)	13 (1)
14 (2)	15 (3)	16 (4)	17 (5)	18 (6)	19 [illegible]	20 (8)
21 (9)	22 (10)	23 (11)	24 (12)	25 (13)	26 (14)	27 (15)
28 (16)	29 (17)					

March

Sun	Mon	Tue	Wed	Thur	Fri	Sat
		1 (18)	2 (19)	3 (20)	4 (21)	5 (22)
6 (23)	7 (24)	8 (25)	9 (26)	10 (27)	11 (28)	12 (29)
13 (30)	14 (31)	15 (1)	16 (2)	17 (3)	18 (4)	19 (5)
20 (6)	21 (7)	22 (8)	23 (9)	24 (10)	25 [illegible]	26 (12)
27 (13)	28 (14)	29 (15)	30 (16)	31 (17)		

2016
1423 Bangla

April Chaitra-Baishakh

Sun	Mon	Tue	Wed	Thur	Fri	Sat
					1 (18)	2 (19)
3 (20)	4 (21)	5 (22)	6 (23)	7 (24)	8 (25)	9 (26)
10 (27)	11 (28)	12 (29)	13 (30)	14 (1)	15 (2)	16 (3)
17 (4)	18 (5)	19 (6)	20 (7)	21 (8)	22 (9)	23 (10)
24 (11)	25 (12)	26 (13)	27 (14)	28 (15)	29 (16)	30 (17)

(1) Write the date in Bangla calendar that was the second Saturday of March in English year 2016.

(2) Write the date in English calendar on which Baishakh of Bangla year 1423 started.

(3) What is the day of week that is 35 days after March 3, Thursday?

(4) What is the day of week that is 21 days after February 13, Saturday?

(5) What is the day of week that is 50 days before April 1, Friday?

(6) How many days are there in February 2016?

12.2. Leap Year, Decade, Era, and Century

A leap year is a year containing 366 days. A year is a leap year if it is divisible by 4, but the years that the tens and ones places are both 0 are not leap years unless they are divisible by 400.

The year 2016 was a leap year. Discuss in the classroom to find other leap years.

Leap years come once every 4 years, so 2020 is also a leap year.

So, 2012 and 2008, were also leap years.

Discuss with your friends whether or not the years 1800, 1900, and 2000 were leap years.

In leap years, February has **29 days** that is 1 day more than 28 days in other years, and so the number of days in a year becomes **366**

How many days were there in February of the following years?

(1) 1918 (2) 1984 (3) 1820

January 1 of the year 2018 was Monday. What day of week was 40 days after January 1?

January 29 of the year 2018 was Monday, and 7×4 days after January 1. So, 40 days after January 1 of the year 2018 would be ......

January 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

What day of week was February 3 of the year 2018? (Use the idea in the question above.)

There are several ways of counting years.

A period of 10 consecutive years is a decade.
A period of 12 consecutive years is an era.
A period of 100 consecutive years is a century.

The 1st century started in the year 1, which was more than 2000 years ago. We are now in the 21st century, which started in the year 2001.

In which century was each of the years 1600 and 1701?

The 16th century started in the year 1501, so the year 1600 is......

In which century was each of the following years?

(1) 1945 (2) 1300 (3) 1899

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12.3. Conversion of Time

Example 1:
Convert into seconds.
(1) 1 hour (2) 1 day (3) 30 days

Solution:

(1)
1 hour = 60 minutes
= 60 × 60 seconds
= 3600 seconds

(2)
1 day = 24 hours
= 24 × 3600 seconds
= 86400 seconds

(3)
30 days
= 30 × 86400 seconds
= 2592000 seconds

Example 2:
Express the following time in month, day, and hour. (Suppose that 30 days = 1 month)
(1) 1000 hours (2) 8000 hours

Solution:

(1)
1000 ÷ 24 = 41 days and 16 hours
41 days = 1 month and 11 days
Therefore, 1000 hours equal to 1 month, 11 days, and 16 hours.

(2)
8000 ÷ 24 =333 days and 8 hours
333 ÷ 30 = 11 months and 3 days
Therefore, 8000 hours equal to 11 month, 3 days, and 8 hours.

Answer the following questions:
(Suppose that 1 month = 30 days)

(1) Convert 5 months to hours.
(2) Convert 2 years to hours.
(3) Convert 12 years 5 months to days.
(4) Express100000 minutes in month, day, hour and minute.
(3) Express10000 seconds in hour, minute, and second.

12.4. The 24-hour clock

The 24-hour clock is the convention of time keeping in which the day runs from midnight to midnight and is divided into 24 hours. The 24-hour notation uses 2 digit numbers for hours and minutes, putting colon ":" (colon) between hour and minute as shown on the right.

Method to read the 24-hour clock

23:59

Twenty-three fifty-nine

Discuss in the classroom what time you do what (e.g., wake up, have meals, go to bed, etc.) Express it in the 24 hour clock.

I always wake up 6:00 a.m. and go to bed at 10:15 p.m.

Yesterday, I had lunch at 1:15 p.m. and dinner at 8:40 p.m.

The table below shows the conversion of time between the 24-hour clock and the 12-hour clock.

24-hour clock

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
a.m.												p.m.											
0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11

12-hour clock

Examples:

The 24-hour clock does not use "a.m." or "p.m." as shown on the right.

The 12-hour clock	The 24-hour clock
6:00 a.m.	06:00
1:00 p.m.	13:00
12:00 a.m.	00:00

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Convert the following time written in the 12-hour clock to the 24-hour clock.

(1) 8:00 p.m. (2) 10:45 a.m. (3) 3.20 a.m. (4) 11:58 p.m.

Convert the following time written in the 24-hour clock to the 12-hour clock.

(1) 07:00 (2) 12:05 (3) 19:24 (4) 23:59

Look at the following railway time table, and answer the questions below:

Railway Time Table: Dhaka - Chattogram

Station	704 Mahanagar	4 Karnophuli Express	702 Suburno Express
Dhaka departs	07:40	05:30	16:30
Dhaka airport departs	08:21	06:25	17:05
Tongi depart	↓	07:47	↓
Ghorashal departs	↓	08:28	↓
Narsingdi departs	↓	08:50	↓
Bhirab Bazar departs	10:17	10:45	↓
Ashuganj departs	↓	11:00	↓
Brahmanbaria departs	10:50	11:29	↓
Akhaura departs	↓	12:15	↓
Cumilla departs	12:11	13:50	↓
Laksam departs	↓	14:45	↓
Hasanpur departs	↓	15:23	↓
Feni departs	13:22	16:06	↓
Chattogram arrives	15:15	18:40	22:35

(1) What time does Mahanagar leave Brahmanbaria?

(2) What time does Karnophuli Express arrive Chattogram?

(3) In order to go to Chattogram from Dhaka in the shortest time, which train do we have to use? Write the reason why you have chosen it.

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Exercise 12

1. Write the number of days of the months:
   (1) Shrabon (2) Bhadra (3) Agrahayan (4) Chaitra
   (5) April (6) July (7) August (8) December

2. Answer the following questions about a calendar:
   (1) What is the date that is 20 days after Baishakh 25?
   (2) What is the date that is 49 days after June 25?
   (3) When May 3 is Tuesday, what day of week is May 31?
   (4) When October 1 is Saturday, what day of week is October 31?

3. How many days were there in February of the following years?
   (1) 1200 (2) 1692 (3) 2010

4. The year 2016 was a leap year, and January 1 of the year 2016 was Friday. What day of week was December 31 of the year 2016?

5. What century was each of the following year?
   (1) 108 (2) 1015 (3) 2001

6. Answer the following: (Suppose , 1 month = 30 days.)
   (1) Convert 10 years to days.
   (2) Express 1000 hours in month, day, and hour.

7. Convert the following time written in the 12-hour clock to the 24-hour clock:
   (1) 3:00 p.m. (2) 11:42 p.m. (3) 0.20 a.m. (4) 12.00 a.m.

8. Convert the following time written in the 24-hour clock to the 12-hour clock:
   (1) 02:04 (2) 15:34 (3) 24:00 (4) 21:13

9. A train left one city at 11:50 and arrived at the destination at 15:25. How long did it take?

Chapter 13

Data Arrangement

13.1. Data arrangement

A teacher checked how many times his grade 5 students submitted homework in the past 3 months. Look at the tables on the right and discuss which section submitted homework more often.

Section A	25, 24, 15, 20, 23, 29, 26, 17, 22, 26, 14, 18, 24, 26, 8, 27, 25, 9
Section B	12, 14, 24, 29, 16, 12, 9, 29, 20, 16, 28, 12, 8, 29, 24, 29, 12, 6, 22, 28

Discuss the following points in the classroom.

- How many students are there in each section?
- What is the average of sumitted home work in each group?
- What numbers are most frequently seen in each group?
- What are the maximum and minimum numbers in each group?
- What can we say when we compare Section A and B?

Calculate the average scores:

Section A: _____ points Section B: _____ points

Choose the correct option.

From the above average scores, we can say that students in Section A submitted homework [more often, less often] than those in Section B.

2025

The following chart shows how the numbers of times that Section A students submitted homework are distributed. (One dot ● indicates one student.)

Group A

Put dots ● in the following chart for Section B

Group B

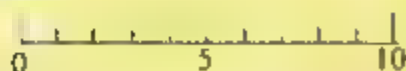
What can we say when comparing the distribution of data of Section A and B?

1

A survey on the number of family members was conducted in a village, and found that the households in its east and west parts have family members as in the following table:

East	5	7	3	4	4	7	2	6	4	5	6	3	5	6	5
West	2	3	8	7	3	4	2	7	5	6	3	4			

(1) Find the average of family members in each part of the village.

(2) Put ● (dot) in the following chart to show the family members of East and West part of the village.

13.2. Use of Tables and Graphs

Discuss with your friends how we can show the distribution of data of Section A students in the previous page more clearly.

Section A	25, 24, 15, 20, 23, 29, 26, 17, 22, 26, 14, 18, 24, 26, 8, 27, 25, 9

Table for Section A

Class Interval	Tally	Number
5 - 9	||	2
10 - 14	|	1
15 - 19	|||	3
20 - 24	𝍸	5
25 - 29	𝍸 ||	7
Total		**18**

Use tally marks when counting!
1 → |
2 → ||
3 → |||
4 → ||||
5 → 𝍸
6 → 𝍸 |
7 → 𝍸 ||

[Note]
Each of these five categories is called a class of data, and each of "5-9", 10-14", etc., are called the **Class Interval.**

Show the distribution of data of Section B students as in the table above.

Section B	12, 14, 24, 29, 16, 12, 9, 29, 20, 16, 28, 12, 8, 29, 24, 29, 12, 6, 22, 28

Table for Section B

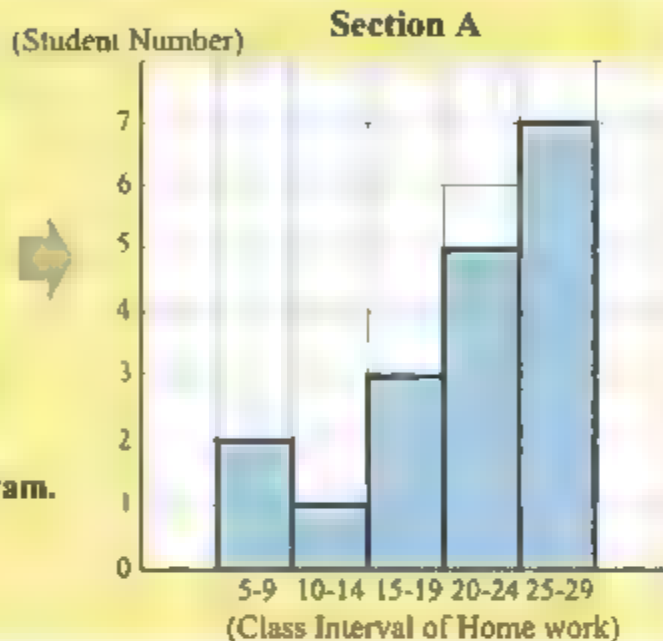
Class Interval	Tally	Number
5 - 9		
10 - 14		
15 - 19		
20 - 24		
25 - 29		
Total		

2025

Use a graph to express the information in the above table on the times that Section A students submitted homework.

Section A

Class Interval to submit homework	Number
5 - 9	2
10 - 14	1
15 - 19	3
20 - 24	5
25 - 29	7
Total	18

This graph is called **histogram.**

How to draw a histogram

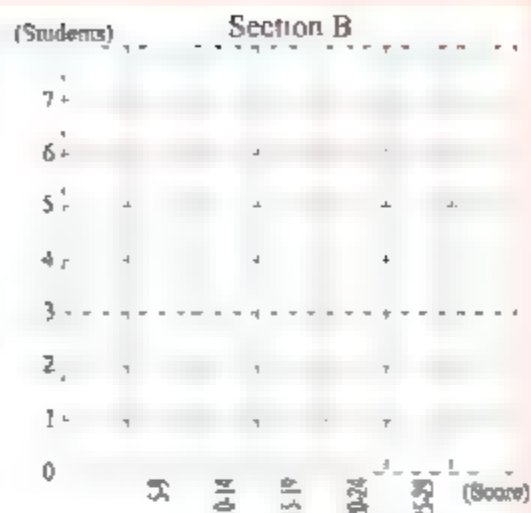
- On the horizontal axis, put marks every 5 times according to the table.
- On the vertical axis, mark the number of people so that all the numbers come in the graph.
- Draw rectangles whose width is the class interval and height is the number of people.
- Note that,
  These rectangles are drawn without gaps in between

2025

1. **Draw a histogram to express the information in the table for the times that Section B students submitted homework.**

2. **Choose the correct answer from the bracket in the following sentence.**

(Students) Section B

7
6
5
4
3
2
1
0
5-9 10-14 15-19 20-24 25-29 (Score)

There are more students in the class interval 20-24 (section A, section B), but there are more students in the class interval 10-14 (section A, section B)

The following data shows the height of grade 5 students in one school. Prepare the table in 3 different class intervals as shown below, and draw a histogram for each table. Then discuss which histogram is appropriate for this data.

Height of students (in centimetres)

130	132	134	128	121	123	138	124	134	139
122	124	126	128	123	126	130	131	137	135
121	125	131	134	133	141	129	133	126	128

Table 1

Height Interval	Number
120-123	
124-126	
127-129	
130-132	
133-135	
136-138	
139-14	
Total	

Table 2

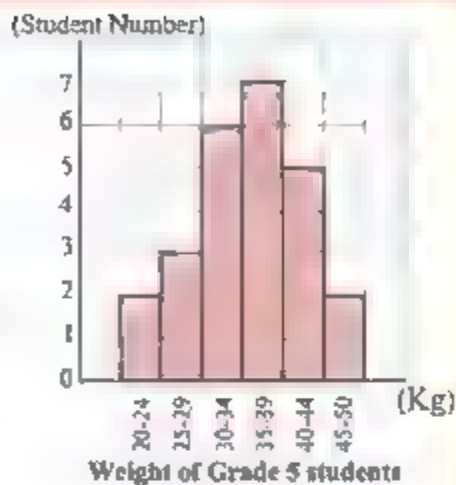
Height Interval	Number
120-124	
125-129	
130-134	
135-139	
140-144	
Total	

Table 3

Height Interval	Number
120-129	
130-139	
140-149	
Total	

Histograms are different very much if the classes are different.

The histogram on the right shows the weight of all the Grade 5 students in one school.

Weight of Grade 5 students

(1) How many grade 5 students are there in this school?

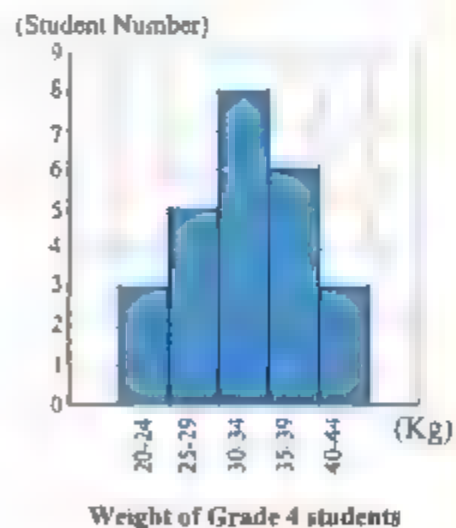
(2) What class includes more students than others?

(3) How many percent of students are in the class 35 – 39?

(4) How many percent of students are less than 29 kilograms in weight?

Make a mathematical problem using the histogram in the above question, and get your classmates to solve it.

The histogram on the right shows the weight of students at the time of Grade 4:

Weight of Grade 4 students

(1) What class includes more students than others?

(2) How many percent of students are less than or equal to 29 kilograms in weight?

(3) What can you find from these two histograms on students' weight at the time of grade 4 and 5?

2025

13.3. Population

According to the survey conducted in 2011, the population of Bangladesh is about 14 crore 23 lac. Table A shows the population in 7 divisions, and Table B shows the population of neighbouring Asian countries.

Table A:
Population by Sex and Division (thousands)

Division	Male	Female
Barishal	4,006	4,140
Chattogram	13,763	14,316
Dhaka	23,814	22,915
Khulna	7,782	7,781
Rajshahi	9,183	9,146
Rangpur	7,824	7,840
Sylhet	4,882	4,925
Bangladesh	**71,254**	**71,063**

Source: Population & Housing Census 2011

Table B:
Population of neighboring countries in 2010

Division	Population
Thailand	6 crore 18 lac
Myanmar	5 crore 5 lac
Sri Lanka	2 crore 4 lac
Bangladesh	**14 crore 23 lac**
India	121 crore 45 lac
Malaysia	2 crore 79 lac
Nepal	2 crore 99 lac
Pakistan	18 crore 48 lac
Singapore	48 lac

Source: State of the world population 2010, UNFPA, Population & Housing Census 2011

Look at Table A, and compare the data by region and by sex. Then share your findings in the classroom.

Dhaka's population is 3 times more than Khulna.

There are less Females in the total population, but more females in some division.

Look at Table B, and compare the data of these countries. Then share your findings in the classroom.

Population density is a measurement of the number of people in an area
Population density = Population ÷ Area

Village [A] has 550 people in the area of 50 square km, and Village [B] has 320 people in the area of 20 square km. In which village is population density more?

Village	Population	Area	Density
A	550 people	50 square km	☐ people/square km
B	320 people	20 square km	☐ people/square km

The following table shows the population, area, and density of several divisions.

Division	Population (thousands)	Area (sq. km)	Density (people per sq.km)
Barishal	8,146	13,297	613
Chattogram	28,079	33,771	831
Dhaka	46,729	31,120	1,502
Khulna	15,563	22,272	699
Rajshahi	18,329	18,197	1,007
Rangpur	15,664	16,317	960
Sylhet	9,807	12,596	779
Bangladesh	**142317**	**147,570**	**964**

Soure: Population and Housing census 2011

(1) Which division has-

(i) the largest population?

(ii) the largest area?

(iii) the largest density of population?

(2) The population in Khulna is more than Sylhet but its population density is smaller than that of Sylhet. Discuss the reason.

(3) In which division can one person occupy more land?

2025

Exercise 13

1. The tables on the right show the result of a survey on the time for home study of grade 4 and 5 students in one school.

Grade 4 Study Time (minutes)	30, 90, 40, 10, 50, 40, 80, 60, 40, 80
	60, 80, 20, 60, 20, 70, 50, 10, 70, 60

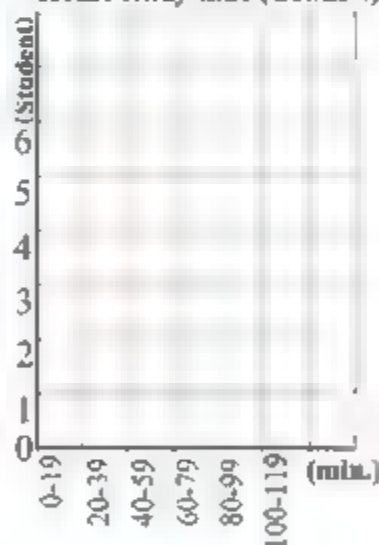
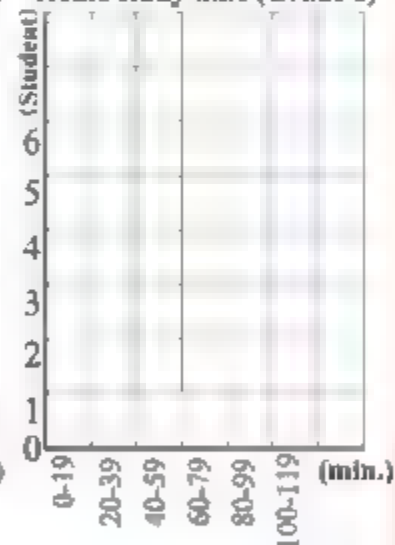
Grade 5 Study Time (minutes)	20, 60, 90, 30, 20, 20, 110, 60, 20, 20
	40, 50, 70, 80, 60, 30, 20, 90, 90, 60

(1) What are the maximum and minimum home study times in each grade?

(2) Find the average home study time of each of grade 4 and 5 students.

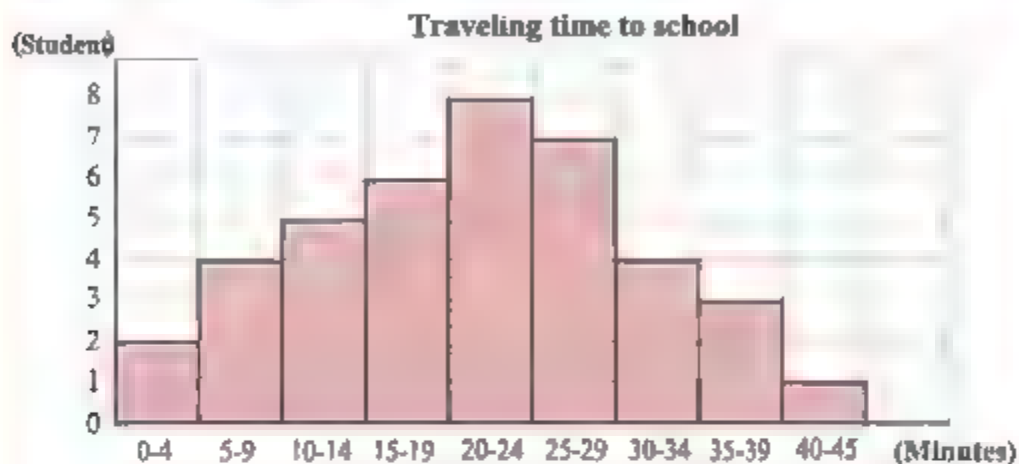
(3) Fill the following table and draw histograms.

Home study time

Time (minutes)	Grade 4	Grade 5
0 - 19		
20 - 39		
40 - 59		
60 - 79		
80 - 99		
100 - 119		
Total		

(4) Compare the histograms for Grade 4 and Grade 5, and write what you have found.

(5) Conduct the same survey in your classroom. Then prepare a table and draw a histogram.

2025

2 The histogram bellow shows the result of survey on how many minutes grade 5 students spend time to come to school.

(1) How many grade 5 students joined the survey?
(2) What class includes more students than others?
(3) How many percent of students spend more than 30 minutes to come to the school?

3 The table on the right shows the population, area and population density of four villages.

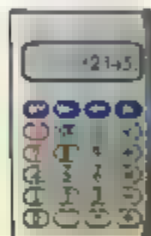
Village	Population (People)	Area (sq. km)	Density (people per sq. km)
A	1,800	15	(a)
B	2,200	(b)	110
C	(c)	25	60
D	2,240	8	(d)

(1) Fill in the blanks (a), (b), (c), and (d).
(2) Which village has
(i) The largest population
(ii) The largest area
(iii) The largest population density?
(3) Which village is more likely to have a large market?
(4) Hakim lives in one of these villages, and says "my village has a huge area but a habitable zone is limited due to the river" In which village is he more likely to live?

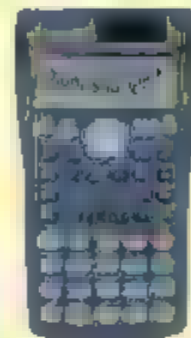
Chapter 14

Calculator and Computer

14.1. Use of Calculators

A calculator is a hand-driven electronic device for simple calculations which runs on an electric battery. There is a variety of calculators according to their usage. Calculators play an important role in our daily life by reducing the time for calculation.

Simple calculator

This is for daily use at home, shops and small businesses.

This is used in academic places from high school to universities, and laboratories.

Now, let's turn on the calculator and use it to solve problems.

Use a calculator to conduct the following calculation.

$$(25 \times 35 - 32 \times 18 + 26) \div 20$$

Press the buttons on the calculator in the order of calculation

3 2 5 ÷ 2 0 = 16.25

2025

Use a calculator to conduct the following calculations:

(1) $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

(2) $1.05 \times 1.05 \times 1.05 \times 1.05 \times 1.05$

(3) $32 - 34 \times 23 \div 25$

(4) $(1170 \div 26 - 1.6 \times 2.5 \times 10 - 4.8) \times 5$

(5) $1.2 \times 4.5 - 0.08 \times 35 + 0.087 \div 0.29$

Selim and Hakim are brothers, and their father gives them money separately.
- Hakim receives 10,000 Taka every year.
- Selim receives 100 Taka in the first year, but from the second year he gets double of the previous year.
In ten years' time, who will get more money in total? Use a calculator to solve this problem.

[Solution]

In ten years' time, the money that Hakim receives will sum up to

$$10{,}000 \times 10 = 100{,}000$$

On the other hand, the money that Selim receives will increase by double every year, such as

1st year 100	2nd year 200	3rd year 400	4th year 800	5th year 1,600
6th year 3,200	7th year 6,400	8th year 12,800	9th year 25,600	10th year 51,200

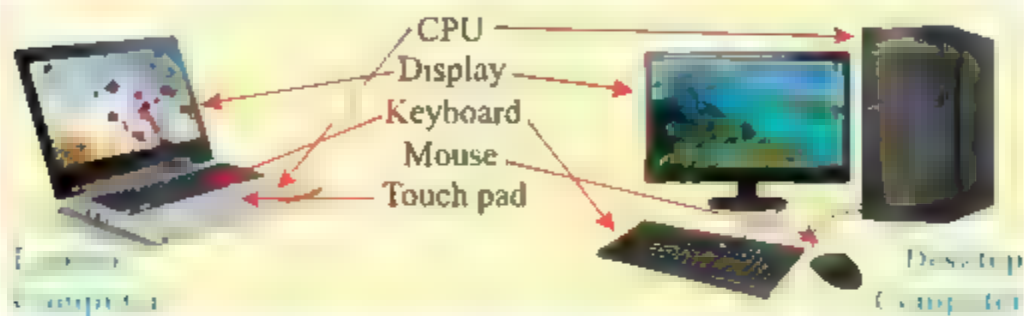
Using a calculator, the sum equals 102,300 Taka. The difference is

$$102{,}300 - 100{,}000 = 2{,}300$$

Thus, Selim will receive 2,300 Taka more than Hakim.

A paper is 0.1 millimetre thick. If the paper is folded 10 times, what will be the thickness of the folded paper?

14.2. Computers

A computer is an electronic device that can carry out calculation on a much larger scale than a calculator. The function and usefulness of a computer is not limited to calculations. It helps us create graphs and pictures, analyze a set of collected data, communicate with other people through the internet, and so on. Computers have drastically changed our life.

Discuss in the classroom

- **For what purposes do people use computers?**
- **What do you think which work we will be able to do in future by using computers?**

The computer is an amazing invention of our time. The present age is often called the computer age. Computer technology has impacted and influenced our lives in manifold ways. One should therefore be knowledgeable about computers from young age.

2025

Exercise 14

1. Use a calculator to do the following calculations

   (1) $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10$

   (2) $1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1$

   (3) $2.4 \div \{0.3 \times (40 \times 0.125 - 1)\} - 2$

   (4) $(2.35 \times 4.9 - 0.15 \times 6.3 + 27.83) \div 15$

2. Use a calculator to do the following activity:

   (1) Choose any number on four corners of a calculator (1,3,7 or 9) and do addition of the three-digit numbers 4 times in anticlockwise (left-handed) rotation starting with those four numbers. What is the sum?

7	8	9
4	5	6
1	2	3

123 + 369 + 987 + 741 = ☐
369 + 987 + 741 + 123 = ☐
987 + 741 + 123 + 369 = ☐
741 + 123 + 369 + 987 = ☐

Think about the reason why the answers are ☐

   (2) Choose any numbers of 1,2,3,4,5,6,7,8 and 9 and do addition of the three-digit numbers 4 times in anticlockwise (left-handed) or clockwise (right-handed) rotation starting with the number. What is the sum?

214 + 478 + 896 + 632 = ☐
874 + 412 + 236 + 698 = ☐

And think about the reason why the answers are ☐

Answers

Chapter-1

Exercise 1-page 6

1. (1) 39,483 (2) 2,86,848 (3) 82, 824 (4) 8,00,415 (5) 85, 81,056 (6) 12,62,676 (7) 23,27,706 (8) 32,41,663 (9) 9,81,400 **2.** (1) 2,15000 (2) 7,20,000 (3) 8,20,800 (4) 50,43,000 (5) 23,80,000 (6) 54,00,000 **3.** (1) 44,955 (2) 59,400 (3) 3,56,400 (4) 39,60,000 (5) 2,323 (6) 31,900 (7) 78,078 (8) 5,65,600 (9) 9,90,000 **4.** Do yourself **5.** 81,000 taka

Chapter-2

Exercise 2- page 11

1. (1) 251 remainder 21 (2) 84 (3) 107 remainder 216 (4) 50 remainder 87 (5) 76 (6) 216 remainder 120 (7) 59 remainder 488 (8) 71 remainder 180 (9) 41 (10) 50 (11) 60 (12) 122 remainder 100.
2. (1) Not Correct (2) Correct (3) Not correct
3. (1) 69 remainder 5 (2) 282 (3) 62 remainder 35 (4) 94 (5) 548 remainder 26 (6) 852 **4.** 151st day **5.** 468 books **6.** 119 employees **7.** 59th month **8.** 174 boxes

Chapter-3

Exercise 3- page 19

1. (1) 5 (2) 17 (3) 2 (4) 2 (5) 5 **2.** 85 taka **3.** 314 taka **4.** 627 taka **5.** 15, 700 taka **6.** 107 taka **7.** 5,520 taka **8.** Farida- 8,750 taka, Fatema-11,200 taka **9.** Raju- 388 litchis, Rony 302 litchis
10. mother's age 45 yrs, son's age 15 yrs **11.** 1,976 **12.** 102
13. 7,560 bi-cycles **14.** 288 taka **15.** 40 kg **16.** 4 litre

Chapter 4

Exercise 4-page 25

1. (1) 9×7 80 closed sentence (false) (2) $42-x$ 35, open sentence (3) $120\div40$ 3, closed sentence (true) **2.** (1) $x=3$ (2) $x=27$ **3.** (1) $x\times4$ cm (2) $x\times x\times3$ square cm **4.** (1) 6 (2) 37 (3) 11 (4) 56 (5) 1 (6) 40
5. (1) $18\times x+12=y$ (2) $y=192$ (3) $x=6$

Chapter 5
Exercise 5-page 37

1. (1) 105 (2) 105 (3) 300 (4) 144 (5) 2,400 **2.** (1) 6 (2) 4 (3) 13 (4) 18 (5) 1 **3.** 100 m **4.** At 9 p.m. **5.** (1) 6 m (2) 42 carpets **6.** 21 students

Chapter 6
Exercise 6(a)- page 44

1. (1) $\frac{8}{3}$ (2) $\frac{28}{9}$ (3) $\frac{60}{11}$ (4) $\frac{63}{10}$ (5) $\frac{41}{2}$ **2.** (1) $2\frac{1}{3}$ (2) $4\frac{1}{5}$ (3) 4 (4) $7\frac{1}{11}$ (5) 22 **3.** (1) $1\frac{1}{6}$ (2) $4\frac{1}{3}$ (3) $1\frac{1}{3}$ (4) $1\frac{3}{4}$ (5) $1\frac{2}{15}$ (6) $1\frac{1}{2}$ (7) $1\frac{7}{20}$ (8) $2\frac{1}{15}$ (9) $\frac{3}{7}$ (10) $\frac{3}{5}$ (11) $2\frac{1}{4}$ (12) $\frac{11}{12}$ (13) $1\frac{13}{15}$ (14) $1\frac{4}{5}$ (15) $1\frac{3}{4}$ **4.** (1) $1\frac{2}{7}$ (2) $1\frac{1}{9}$ (3) $5\frac{3}{4}$ (4) $\frac{5}{11}$ (5) $1\frac{1}{3}$ (6) $\frac{4}{5}$ (7) $\frac{6}{13}$ (8) $\frac{17}{24}$ (9) 1 **5.** $6\frac{1}{12}$ m. **6.** Gita's, $\frac{5}{24}$ L.

Exercise 6 (b)-page 63

1. (1) $2\frac{2}{3}$ (2) $1\frac{4}{5}$ (3) $2\frac{1}{2}$ (4) $1\frac{1}{2}$ (5) $\frac{10}{49}$ (6) $\frac{9}{32}$ (7) $\frac{5}{14}$ (8) $\frac{7}{24}$ (9) $\frac{1}{2}$ (10) 2 (11) $\frac{9}{10}$ (12) $\frac{25}{56}$ (13) $\frac{6}{7}$ (14) 8 (15) $\frac{1}{2}$ (16) 28
2. 15 quintal **3.** $1\frac{19}{20}$ kg **4.** $\frac{5}{9}$ square meters **5.** (1) $\frac{3}{7}$ (2) $\frac{1}{5}$ (3) $\frac{5}{32}$ (4) $\frac{3}{16}$ (5) $2\frac{1}{10}$ (6) $\frac{8}{81}$ (7) $\frac{4}{5}$ (8) $\frac{9}{20}$ (9) $\frac{3}{4}$ (10) $\frac{3}{4}$ (11) $1\frac{1}{2}$ (12) $1\frac{1}{3}$ (13) $12\frac{3}{5}$ (14) $9\frac{1}{3}$ (15) 1 (16) 4 $\frac{8}{9}$ **6.** 8 pieces **7.** $1\frac{5}{7}$ square m.
8. $1\frac{3}{4}$ m. **9.** (1) $\frac{1}{12}$ (2) $\frac{1}{10}$ (3) $\frac{1}{10}$ **10.** (1) $16\frac{2}{3}$ square meter (2) $4\frac{2}{3}$ L (3) 5,000 taka.

Chapter 7
Exercise 7(a)-page 77

1. (1) 35 (2) 104 (3) 23456 **2.** (1) 0.8 (2) 1.5 (3) 4 (4) 0.09 (5) 0.36

(6) 0.3 (7) 0.056 (8) 0.02 **3.** (1) 6.9 (2) 51.2 (3) 22.4 (4) 45 (5) 6.24 (6) 18.12 (7) 54.63 (8) 20.4 (9) 0.939 (10) 5.915 (11) 4.056 (12) 14.77 **4.** (1) 50.4 (2) 388.6 (3) 105 (4) 171 (5) 146.28 (6) 91 (7) 435.84 (8) 120.9 (9) 5.98 (10) 102.6 (11) 236.06 (12) 156 **5.** (1) 37.6 (2) 62 (3) 410.5 (4) 890 **6.** 18 m **7.** 30.78 kg **8.** 16.7 L **9.** (1) 0.4 (2) 0.3 (3) 0.6 (4) 0.03 (5) 0.07 (6) 0.09 (7) 0.008 (8) 0.008 **10.** (1) 0.6 (2) 0.5 (3) 0.04 (4) 0.05 (5) 0.05 (6) 0.005 (7) 0.006 (8) 0.005 **11.** (1) 1.7 (2) 1.4 (3) 0.78 (4) 0.73 (5) 0.772 (6) 0.703 (7) 8.013 (8) 13.046 **12.** (1) 0.65 (2) 0.64 (3) 0.05 (4) 10.304 (5) 10.005 (6) 7.008 (7) 1.6 (8) 0.125 **13.** (1) 2.3 (2) 2.9 (3) 6.8 (4) 2.4 (5) 0.26 (6) 3.06 (7) 4.24 (8) 2.25 **14.** (1) 0.247 (2) 0.3 (3) 0.051 (4) 0.42 **15.** 3.92 litres **16.** 0.345 kg

Exercise 7(b)-page 87

1. (1) 48 (2) 72 (3) 35 (4) 16 (5) 45 (6) 12 (7) 20 (8) 2 **2.** (1) 10.105 (2) 14.852 (3) 1.672 (4) 4.368 (5) 0.31 (6) 1.36 (7) 0.215 (8) 0.168 (9) 0.7 (10) 25.12 (11) 5.4 (12) 9.1 **3.** (B) **4.** 21.59 cm **5.** 663.4 km **6.** 60.8 square m. **7.** brother 29.2 kg, father 58.4 kg **8.** (1) 10, 1.25 (2) 100, 12 (3) 1000, 40 **9.** (1) 5 (2) 60 (3) 30 (4) 60 **10.** (1) 8 (2) 8 (3) 0.6 (4) 0.7 (5) 70 (6) 0.5 **11.** (1) 2.6 (2) 3.9 (3) 2.4 (4) 234 (5) 48 (6) 225 (7) 105 (8) 204 (9) 750 **12.** (C) **13.** 45.8 km **14.** 32.4 m **15.** 4.8 kg

Chapter 8

Exercise: page 93

1. (1) 9.5 (2) 35 (3) 135 (4) 954.6 **2.** 154 g **3.** 15 L **4.** average of Sohel's marks 74.8, average of Hamida's mark 80; Hamida performed better **5.** (B)

Chapter 9

Exercise: page 99

1. (1) 60% (2) 450 taka (3) 75 g **2.** 56 students **3.** (1) Hosain spends 70%, Shamim spends 80% (2) Shamim **4.** 11,200 taka **5.** 21,000 taka **6.** 12% **7.** 1,440 taka **8.** 4,500 taka.

Chapter 10

Exercise: page 112

1. Do yourself. **2.** (1) 6 cm (2) 4 cm (3) 70 degree (4) 110 degree **3.** (1) quadrilateral (2) parallelogram (3) rhombus **4.** side CD (DC), FE (EF), **5-6.** Do yourself **7.** (a) radius (b) arc (c) chord (d) diameter (e) 5 **8.** (1) 80 cm (2) 16 cm **9.** 32 cm **10.** Do yourself.

Chapter 11

Exercise 11(a): page 121

1. 39 cm **2.** 25 cm **3.** Mina **4.** 6.7 kg **5.** 9.92 kg **6.** 564 hectogram **7.** 0.57 L. **8.** 8.4 L **9.** 25 dL

Exercise 11(b): page 131

1. Do yourself **2.** (1) 10 square cm (2) 27 square cm (3) 30 square cm (4) 20 square m **3.** 9,000 are **4.** 85 m **5.** 3 km. **6.** 562.5 square m. **7.** (1) 22.5 square cm (2) 32 square cm (3) 35 square cm (4) 25 square cm **8.** Do yourself.

Chapter 12

Exercise: page 141

1. Do yourself **2.** (1) Jaisthya 14 (2) August 13 (3) Tuesday (4) Monday **3.** (1) 29 days (2) 29 days (3) 28 days **4.** Saturday **5.** (1) Second (2) Eleventh (3) 21 st **6.** (a) 3,600 days (b) 1 month 11 days 16 hours **7.** (1) 15:00 (2) 23:42 (3) 00:20 (4) 12:00 **8.** (1) 2:04 a.m. (2) 3:34 p.m. (3) 12:00 a.m. (4) 09:13 p.m. **9.** 3 hours 35 minutes

Chapter 13

Exercise: page 150

1. (1) class 4, 51min , class 5, 52 min (2) maximum time in grade 4 is 90 min, minimum time is 10 min; maximum time in grade 5 is 110 min, minimum time is 20 min (3)-(5) Do yourself **2.** (1) 40 students (2) 20-24 minutes (3) 20% **3.** (1) a. 120 b. 20 km^2 c. 1,500 d. 280 (2) (i) D (ii) C (iii) D (3) D (4) C

Chapter 14

Exercise: page 155

1. (1) 36,28,800 (2) 1.771561 (3) 0 (4) 2.56 **2.** Do yourself.

End

Academic Year 2025, Class Five – Math

Mathematics...possesses
not only truth, but supreme beauty... .
– Bertrand Russell

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